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UNIVERSITY OF ALBERTA

INVESTIGATING RELATIONSHIP AGGRESSION USING AN EXPERIMENTAL APPROACH

by

TRACY MARILYN PROSTEBBY

A THESIS SUBMITTED TO

THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

OF MASTER OF ARTS

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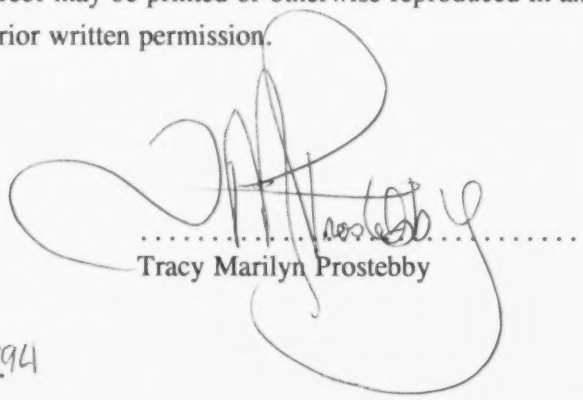

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled "Investigating Relationship Aggression Using an Experimental Approach" submitted by Tracy Marilyn Prostebby in partial fulfillment of the requirements for the degree of Masters of Arts in Sociology.

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ABSTRACT

The purpose of this thesis is to determine the impact of aggression on aggressive response in a two person interaction. A social interaction perspective is taken in a laboratory experiment designed to test hypotheses of aggression causality. This perspective captures the dynamic process of relationship conflict. It assumes certain aversive acts presented during interaction may control and reinforce, sometimes inadvertently, aggressive behavior.

An experiment on aggression was conducted at the Center for Experimental Sociology, at the University of Alberta, Canada, which consisted of a confederate playing a competitive board game individually with sixty volunteer university students. The confederate manipulated two types of aggression which acted as prior aversive stimuli to the subject's aggression response rate. A hypothesis of *matching* hostile aggression, aggression that intends to hurt as its goal, was tested. It was presented in the form of a **punishment**. A second hypothesis that was tested was that a person is most likely to use functional (or instrumental) aggression when it gives the aggressor some reward *besides* harming another person. Presented in the form of a **penalty**, it was a game winning strategy.

The results of 'matching' aggression support the theory that a) people retaliate attacks with hopes of getting even or preventing further attacks, and b) people are more likely to lash out when they are in pain. The functional aggression results show several subject penalty use patterns emerged. Discussion of functional aggression centered around cost-benefit analysis and cooperating versus competing.

This thesis concludes with recommendations for testing aggression causality in *dyad relationships that are more intimate and complex,* i.e., a marital couple. The discussion focuses on the efficacy of applying a similar methodology to examine factors which may dramatically increase the likelihood of a couple engaging in aggression and violence.

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CHAPTER 1

INTRODUCTION

One way to examine causes of aggression within a relationship is to look at the dynamic characteristics of the exchanges occurring. Rather than viewing aggression as an individual pathology, which focuses on *intrapersonal* factors as causative, it is regarded as a result of interaction between two people. The focus here is on what *interpersonal* factors in a person's social environment are largely controlling his or her aggressive behavior. For example, during social exchanges involving conflict, what behaviors presented by one person at least partially reinforce aggression and other hostilities in the other person? What factors increase or decrease the likelihood of ongoing negative exchange patterns developing between the two people? This view of aggression being a product or outcome of social interaction is the theoretical frame of reference in this study.

The present study will investigate in detail the dynamics of negative exchange. Specifically, this thesis examines the notion that aggression is a product of social interaction and has 'exchange properties' which may take the form of retaliation or lashing out at being hurt, or may be applied as a means to an end. The Reciprocity Principle is tested as an explanation for 'matching' aggression or retaliation. Reciprocity, in the simplest form, is a norm of social interactive behavior which says people exchange things as repayment for getting past things or in anticipation of future things (Gouldner, 1960). Norm of reciprocity presumes the members are actually interacting by attending to one another's communication messages. Attending is an important criteria of reciprocal behavior because the receiver of a message must first be aware of the other's action in order to be open to being affected by it. Dyad members who do not attend, i.e., ignore both positive and negative acts by the other person, will not respond during conflict to that person's behavior because he or she is not paying attention. A second criteria of reciprocity, besides attending, is that the exchanges taking place are seen as fair or equitable to the dyad across time in their relationship. The Reciprocity Principle assumes then that during social interaction similar acts, positive or negative, are exchanged, or 'matched'.

For those theorists who suspect aggression has 'exchange' properties, i.e., retaliating extremely aversive behavior with hostility, alternative explanations need to be ruled out. Applying the experimental method for this purpose is useful. In a laboratory setting, concepts relevant to hypotheses based on particular aggression theory can be carefully operationalized with some attempt to control for other

potentially confounding variables. This measurement strategy allows investigators to analyze whether a negative response of aggression to aggression stimulus is a product of prior negative behavior presented during the interaction, i.e. being insulted, or whether some factor other than those offered by the other dyad member is responsible. Thus, a key objective of this study is to see if the variance in aggressive response rates can be explained by manipulation of aggressive stimuli, in this case the two main predictor variables punishment and penalties. The central research problem of this thesis is stated in the following question: '*In a two-person social interaction what effects do negative interpersonal factors have on aggressive behavior response rates across exchanges?*'

The next sections, chapters two, three, and four discuss the experiment which was conducted in this thesis in order to answer the question 'what stimulus(i) elicits varying aggressive response rates in a subject in a two-person interaction?' For example, do subjects 'match' negative stimuli in kind and in number, i.e., subject retaliates repeatedly unprovoked punishments with the same degree of misery received? Do subjects distinguish in response between two types of aversive stimuli, that of punishment which intends to hurt or demean as its purpose, and that of penalties which also hurt another but are applied as a means to another goal of the aggressor?

The findings from the aggression experiment are interpreted in the final chapter, chapter five. That section is divided into two parts. The first part comments on the strength of the social principle of reciprocity as an explanation for any 'matching' of aversive behaviors found in the experiment conducted on aggression. The second part explores issues that arise if investigation of interpersonal communications involves more complex negative exchanges than the simple tit-for-tat matching examined in this present study. An example of a dyad relationship that is expected to have complex patterns of both negative and positive exchanges is a married couple. This complexity results, in part, because the couple has many resources to exchange with each other, has numerous needs and goals within and outside that relationship, and share a history of past exchanges and future expectations. These relationship aspects affect the influence interpersonal factors have on their typical daily interactions, which may include arguments where aggression and/or violence is engaged in. For example, if a distressed couple has developed an interaction pattern of avoiding each other, to avoid unpleasant or hurtful arguments, they may not attend to each other's negative or positive actions. A person may not respond to his or her spouse until one partner becomes very aversive, i.e., uses some form of violence, and even then may not 'retaliate'.

Research findings in marital violence literature will be presented that indicate distressed couples engage in some form of 'matching' of negative and positive behaviors. It is not clear from that literature how the Principle of Reciprocity is operating. However, the final section of chapter five presents an argument suggesting the Reciprocity Principle is still relevant as an explanation for

negative exchange patterns of couples, particularly those identified as distressed or violent ones.

The next section, Chapter Two, introduces the reader to several hypotheses on aggression tested in the thesis experiment. The experiment was conducted using a competitive board game that contained punishments and penalties. These predictor variables were manipulated by a trained confederate within a laboratory setting. The participants of the experiment who played a competitive game with the confederate were volunteer subjects from the University of Alberta, Canada.

CHAPTER 2

BACKGROUND THEORY AND RESEARCH ON AGGRESSION

In this thesis two types of aggression are investigated in an experiment involving two-person interaction exchanges.[1] The first type of aggression investigated in this study is hostile aggression. It is 'nonfunctional' in that the hurt or pain that is delivered to a target is an end in itself. In the experiment, the 'punishment' manipulation represents this form of aggression. The second form of aggression studied is also behavior intended to harm the target, but it is 'functional' aggression. The harm is inflicted to serve some purpose beyond physical or psychological pain. It is imposed on a target for deterrence or control purposes. This second aggression, a means to an end, is often called instrumental aggression (Berkowitz, 1993; Myers, 1990). In the present study it is represented by the 'penalty' condition.

Hypotheses derived from both kinds of aggression will now be discussed. The first hypothesis concerns factors in a dyadic interaction which elicit hostile aggression.

A. Aggression Hypotheses

1. Hostile Aggression Hypothesis (punishment)

The first issue in this experiment is whether subjects will exchange punishers which serve no function other than hurting the opponent. During real life exchange processes such as in an argument, do people tend to exchange similar kinds of tangible and intangible punishers? This experiment hypothesizes a 'matching' of hostile aggression between exchange partners. A hypothesis at the conceptual level would be that:

---

[1]Aggression used by one person against a target person is commonly defined in social psychology literature as "a behavior that is intended to harm or destroy another person" (Alcock, 1991, p. 355). The intended harm can be physical, psychological, or both. According to this definition, shooting directly at a person would be considered aggressive, even if the shot missed its mark. The aiming of a weapon at another person places the action within a social context that 'infers' harmful intent. It is not always easy to determine intent however; a person can be hurt by accident, or from a 'hurtful action', as a means to an end, one other than the pain itself.

H_1 : Subjects will match each other's non-functional hostile aggression.

The hostile aggression in the experiment is manifested by a "foolish farm fair". A foolish farm fair consists of a person being punished by having to stand up to face their opponent, wear a silly farm animal hat, and sing a children's rhyme while making animal noises. It was assumed that this would be a degrading and punishing experience.[2] That is, making someone perform some "foolish farm fair" acts is assumed to be a hostile aggressive act. The fair is manipulated by a confederate in a game board situation. The foolish farm fair, first held by the confederate, acts as an early prior aversive experience in the play of a game. A subject's subsequent responses were monitored in order to see if they 'match' the confederate's hostile aggressive act. A match is inferred if a subject responds or reciprocates by also holding a foolish farm fair. Whether a subject holds a farm fair at all, and how many times, are the specific aspects of matching being measured.

In addition to the aversive hostile aggression manipulation just described, two additional variations on hostile aggression were examined. In one variation, the confederate would never employ hostile aggression against a subject. In another condition the confederate would only retaliate with hostile aggression (the foolish farm fair) if it was used ***first*** by a subject. That is, in this last condition, the confederate never initiated the farm fair, but would retaliate to subject's holding a farm fair. This experiment, thus, featured three manipulations of hostile aggression addressed to the subject: 1) confederate initiates hostile aggression; 2) confederate never uses hostile aggression; 3) confederate retaliates only after attacked first by subject. It is hypothesized that:

H_{1A}: Subject's use of hostile aggression will be highest when first attacked by the confederate. It will be lowest when the confederate only retaliates or never uses hostile aggression.

We must now consider a rationale for these hostile aggression hypotheses. Specifically, what basis is there in the literature on aggression for making these predictions?

Rationale for Matching Hostile Aggression

The hypothesized matching of hostile aggression is based on two principles of social interaction. (a) The first reason matching is anticipated is due to 'the

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[2]A manipulation check was built into the experiment in order to see if the action was regarded by subjects as an aversive hostile stimulus. Subjects were asked to rate the embarrassment associated with the experience.

norm of reciprocity' which governs social exchanges. (b) A second reason for matching is that the aggressive response by a subject is a form of punishment-induced aggression. The prior aversive stimulus imposed by the confederate is a deliberate attempt to embarrass and humiliate. It serves no other function at all in terms of assisting the confederate in winning the game. Therefore, the most likely response from a subject is also one that intends to hurt the punisher as an end in itself. We will first discuss the norm of reciprocity basis for matching.

(a) Matching Hostile aggression anticipated from a 'norm of reciprocity' in social exchanges

People exchange various resources when they interact with one another. People generally give with the expectation of receiving something in exchange (Avery and Ridley, 1979; Blau, 1964; Patterson, 1971; Walster et al., 1978). This is the essence of reciprocity: you will give to others according to what you receive from them. The norm of reciprocity first articulated by Gouldner (1960), "is a universal norm, (which) requires that people help, not harm, those people who have helped them in the past. In any given situation, a person might help because of anticipated future helping or repayment for past help" (Alcock, 1991; p. 399). It has been used commonly to predict and explain reciprocity of positive, or non-aversive/non-harmful resources. For example, in a helping behavior situation, if one has received assistance, such as emergency baby-sitting from a neighbor, he will return the baby-sitting favor someday. It is argued in this thesis that this norm is also amenable to examining exchange patterns of negative or aggressive behaviors. Whether the behaviors are positive or negative, according to this norm humans tend to seek equitable exchanges, a balance over time.

What if harm or injury is the medium of a social exchange? Can the norm of reciprocity be extended to describe harmful behavioral exchanges? If so, we would expect that an aggressive act by actor A will be matched by a counter-aggressive act from actor B. Research on aggression shows that unpleasant stimulus affects a person by increasing the likelihood of an aggressive response towards a target (Berkowitz, 1993; p.76). The source of the initial pain is expected to be the most likely target to lash out at. While the term 'to reciprocate' is associated with neutral or good exchanges, the term 'to retaliate' is more appropriately connected with negative, aggressive exchanges. On one hand, if I am given a wonderful present, I do not think in terms of 'retaliating' with a wonderful gift. On the other hand, if you impose some punishment or hostile aggression on me, I am more likely to think in terms of getting you back for hurting me. Reciprocity is expected in negative exchanges, but the negative 'giving back' for the negative 'getting' is retaliatory reciprocation, or simply retaliation. The 'norm of retaliation' then is a specific descriptor for negative reciprocity. Behavior expectations of the two norms, retaliation and reciprocity, are represented in Figure 1.

Figure 1 Exchange Behavior Expectations: Norms of Helping and Harming in Social Interactions.

Norm of Retaliation	Norm of Reciprocity
returning prior aversive stimulus (matching)	exchanging goods, favors (matching)

Looking at figure 1, matching is expected for both exchanges fitting norms of reciprocity (positive behavior) and retaliation (negative behavior). Rather than thinking in terms of *giving* pain in order to receive future pain, the retaliation norm implies hostile aggression is *elicited or provoked* by some previous painful or hostile condition (Berkowitz, 1989). Obviously, the purpose of a retaliatory act is to discourage future aggression by the originator. One hopes by retaliating to bring the aversive exchange to an end. If one's initial retaliation is not effective, he or she will up the ante, in anticipation that harsher retaliation will bring things to an end. The long term prospects of positive exchange are different. One pays back a benefactor to ease the potential unpleasantness of incurring a long term unpaid debt. Once reciprocity has occurred, however, one would not be discouraged if, in the future, a new exchange is initiated. In other words, positive exchanges are to be welcomed. Reciprocity serves to maintain such exchanges because it imposes a measure of fairness on the transaction. In contrast, successive aversive exchanges are inherently unpleasant and unwanted. In this instance, reciprocity serves to terminate and, hopefully, end the exchange forever. An unwillingness or inability to reciprocate one's aggression may actually maintain another's aggression, employed as a tool to coerce or take advantage of the non-reciprocator. Several studies have been conducted to investigate reciprocity in exchanges between individuals. Some of the ones that explored reactions to negative stimulus are now presented.

Foa and Donnenwerth (1974) did a series of experiments on individual response to 'injustice'. They found that when one person in the experiment setting was harmed emotionally by another, the response was to retaliate. When the degree of injury incurred and the appropriate level of retaliation to 'even the score' was unclear, the subjects reported the best response was to "do unto them exactly what they have done unto you" (Walster et al., 1978; p. 152).

Studies conducted using game theory that assess cooperation are applicable to the hypothesis of negative reciprocity. One game strategy, 'tit-for-tat', or 'an eye-for-an-eye', has been investigated for its ability to predict reciprocation of negative behavior in a two-person interaction. The idea behind 'tit-for-tat' is being

nice via cooperation in exchanges, until someone crosses you. This hostile exchange must be retaliated as punishment for lack of cooperation (Alcock, 1991; p. 555).

One of the most commonly researched games in a laboratory setting is Prisoner's Dilemma. Two guilty suspects are given a chance to confess separated from one another, or not to confess. Their choice carries varying degrees of severity of a 'crime sentence'. In some versions played in experimental settings, if both subjects cooperate by not confessing, they receive mild sentences, but if only one person confesses, that person receives no punishment and the silent person receives the harshest punishment. Therefore, a subject undergoes the least risk by confessing, because not to do so may result in the harshest penalty if the other confesses. Both people may follow the same reasoning and are trapped into not cooperating, not being mutually silent. Numerous studies report that many people do in fact *choose to confess* in the Prisoner's Dilemma encounter (Myers, 1990; pp. 483-486).

Braver (1975) also conducted a laboratory experiment on reciprocal effects in Prisoner's Dilemma game but added prior cooperation measures into the study. He tested the hypothesis that prior mutual cooperation will induce cooperation by subjects when they played the Prisoner's game. Subjects first played a differential power game with a simulated opponent who rewarded the subject on 0, 50, or 100% of the trials. The power game was repeated and the subject was given the power to reward the opponent if desired. When the subjects played the Prisoner's Dilemma game afterwards with their same simulated opponent, Braver found reciprocity affected behavior responses in the Prisoner's Dilemma encounters. Either reciprocal giving or reciprocal withholding of reward in the power game promoted the greatest degree of cooperation by subjects in the Prisoner's Dilemma game. Those subjects who experienced reciprocal exchanges with their opponents in the power game tended to continue to 'cooperate' later on. It is possible that those prior encounters of mutual cooperation served to lessen uncertainty about the response expectations subjects had of their opponents, and of themselves. Previous patterns of cooperation found in one game may have increased trust levels later of anticipated continued cooperation.

Several laboratory experiments have been conducted on reciprocity response to being 'attacked' (Taylor and Pisano, 1971; Dengerink and Myers, 1977; Ohbuchi and Kambara, 1985). These experiments all confirmed that subjects did not 'turn the other cheek' on being attacked. Instead subjects tended to retaliate with similar degrees of 'pain'. Most of the experiments followed a format where one person competed with a simulated opponent in a reaction-time contest. The 'winner' after each trial got to choose how much 'shock' the loser should receive as punishment (no actual shocks were given). The studies found that when the simulated opponent steadily escalated the amount of shock the subject should receive as the 'loser', the subject responded in a tit-for-tat manner when given the

chance to shock the opponent back, i.e., gave the opponent 'matching' levels of shock back in retaliation.

It is apparent that evidence exists in the literature on negative interaction for the norm of reciprocity operating in responses by individuals. An alternative explanation for 'matching' hurtful behaviors is that the response may be a 'reflexive' reaction to being exposed to some unpleasant stimulus. A hypothesis on elicited aggression is now described that differs from the hypothesis relating to the social norm of reciprocity.

(b) Matching Hostile aggression is anticipated because the prior aversive stimulus itself evokes a hostile response.

The second explanation for matching in aggressive exchange is that aversive stimuli have been shown to elicit a form of 'reflexive' or automatic aggression (Jones & Bogat, 1978; Patterson, 1982; Rotton, Frey, Barry, Milligan, & Fitzpatrick, 1979; White, 1979; Zillman, Baron, & Tamborini, 1981; and Zillman, Bryant, Comisky, & Medoff, 1981). According to this perspective, animals and humans are biologically disposed to react aggressively to being hurt. People in this situation are both motivated to escape and attack. So, while a response to aversive stimulus may be defensive, in an attempt to stop the unpleasantness, the hostile aggressive response is also an intentional "inclination to harm available targets".[3]

Several studies have looked at behavioral responses by individuals to elicited aggression. A study done by Patterson (1982) examined family interactions of boys who had been labeled aggressive or 'out of control' by their families, schools or the courts. Observers went to the families' homes and coded behavior of the family members every five seconds. In contrast to behavioral exchanges found in the nonproblematic child families, the problematic family exchanges included "long sequences of coercion and retaliation....Arguing, threatening, or teasing by one individual elicited retaliation from another family member, which would exacerbate the behavior of the first member....Punishment was often ineffective and actually led to more rather than less subsequent antisocial behavior" (Alcock, 1991, p. 351).

Geen (1968) conducted an experiment on aggression response to being either attacked or frustrated. The attack was given in the form of a gratuitous insult to the subject's intelligence. Geen hypothesized that being attacked would elicit a stronger aggressive response in a subject than being frustrated would. He measured aggression response using an 'aggression machine' (Buss, 1961) in which the subject chooses among ten intensities of shock she thinks is being delivered to

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[3]Found in "Aggression and Violence", ch. 8, p. 342, in **A Textbook of Social Psychology**, edited by Alcock et al., 1991.

another person. No shocks were actually given, and the other subject was an experimental confederate.

Geen found that subjects who were attacked, by being insulted, later gave much higher shock intensities to the insulting confederate than those who were in the frustration treatment groups. Results from a follow-up survey assessing levels of anger felt by the subjects showed that the subjects' reported degree of anger after being frustrated or attacked corresponded to the shock intensities they meted out to the confederate.

Studies have been done on 'reflexive' aggression responses to unpleasant stimulus other than attacks by another person. These studies found that if the stimulus has aversive meaning for the person it can also serve as a negative stimulus that 'draws out' a hostile response. Several studies confirm this and are briefly presented for their relevance to the hypothesis being explored in this section.

Fraczek (1983) carried out an experiment in which subjects learned to associate the color yellow with cigarettes (a pleasant association for them), or the receipt of electric shocks (an unpleasant association). The subjects were required to punish another person shortly after, in the presence of either yellow or another color. Fraczek found the subjects were the most aggressive in their punishments who had earlier learned to associate yellow as an unpleasant stimulus. Some stimulus can take on an aversive meaning which draws out an aggressive attack when presented. The stimulus may have no aversive qualities by itself, but becomes linked with 'pain' from earlier experiences connecting it to pain, i.e., being shocked in the presence of the color yellow.

Things in a person's immediate environment can induce aggression, with the target of that aggression being someone or something that is not even the source of the aggressor's original pain. Baron and Bell (1975) investigated very hot temperature effects on aggression response in a laboratory setting. They found non-angered university students who were in a hot laboratory (33 to 35 degrees Celsius) were more aggressive toward a peer when that individual made mistakes on a task than were the control subjects located in a less aversive environment.

Berkowitz et al. (1981) also conducted an experiment on aggression in subjects who received some aversive stimulus in the environment. Some subjects received a painful stimulus by immersing their hand into a bucket of icy cold water. The control subjects immersed their hand into comfortable water. When the experiment subjects who had received the painful stimulus were given the choice to punish or reward a 'worker' confederate they were 'supervising', those who were hurt punished the worker more than those whose hand was immersed in comfortable water. There was an interaction effect between painful treatment and subject awareness that the punishment they gave would either help or hurt the worker.

When the subject was in 'icy cold' water *and* informed the punishment would *hurt* the worker, they punished the worker the most of all the treatment group subjects.

To summarize the first hypothesis presented in this section on aggression response, matching of hostile behavior is expected either because of the social norm of reciprocity, or as a reaction to being hurt or irritated in some way that induces aggression. Evidence from studies on aversive stimulus demonstrate that these hypotheses have merit for explaining aggression. The studies also show that higher cognitive reasoning may occur in the subjects who reciprocate being attacked with 'matching' levels of aggression in their retaliatory response. The subjects gave back the same thing they received, and to the target who was the source of the attack on them. In the case of the subjects who aggressed as a result of receiving pain from various negative stimulus, the response they gave was aggression of a different kind, and was not always given out to the target who caused their pain. For example, those subjects whose hand was immersed in icy water attacked a target person close by, not the icy water itself. They also gave a different kind of punishment to that person than icy water.

Use of other aversive stimulus, i.e., hot room temperature, suggests that people in pain may lash out more readily from the fact that they hurt. It is a human response that has received support from evidence in studies. In these situations there may be less cognitive thinking going on about the social situation before subjects respond, i.e., the notion of reciprocity is a social principle that speaks of social expectations people have of appropriate exchanges, such as retaliating attacks or rewarding kindness.

A second type of aggression that does not interpret aggression as an end in itself, i.e., to retaliate from being hurt yourself, is aggression that is applied by a person as a means to an end, other than hurting by itself. Sometimes called 'instrumental' aggression, an hypothesis based on this orientation will now be discussed.

2. Functional Aggression Hypothesis (penalty)

Hypothesis two examines functional aggression. Called penalties in the experiment, these aggressive acts differ from punishment in significant ways. A key difference is that the intentional hurtful action is only a means to an end. Any hurt that is inflicted from using a penalty is done in order to receive some other benefit. The central issue being scrutinized in hypotheses two, in general terms, is: Will a person impose a penalty that serves the purpose of increasing one's likelihood of receiving a reward? The hypothesis on penalties is:

H_2 : A penalty will be used whenever it will put the subject ahead of the confederate and whenever it keeps the confederate from winning.

What is a penalty? How does it differ from punishment?

The penalty is a behavior maintained by reinforcing consequences. As long as the person anticipates gaining some advantage, penalty use will continue. The person using the penalty does not hurt another person by accident or out of anger, but only as an intermediate step to gaining some advantage or reward. By focusing on the reinforcing consequence, a penalizing person may act aggressively without emotional hostility.

Measuring penalties in the aggression experiment

In the aggression experiment, a penalty is measured by a farm disaster. If a subject lands on a farm disaster spot, she may penalize her opponent by sending him back a number of spaces on the game board. A person has the option to not use the penalty, indicating this by saying "pass" when the opportunity arises. The penalty serves the function of increasing a player's chances of winning. The opponent is hurt by being forced to go backwards on the board, which gives the penalizer a winning advantage. Putting an opponent back serves the function of putting the penalizer closer to the finish space on the board. She then gains the advantage of reaching it first before her opponent. Penalizing does not, however, have the purpose of humiliating or demeaning that imposition of punishment does.

In the present experiment, using a penalty incurs no immediate cost to the penalizer. A future cost, however, may be retaliation from the penalized person being disadvantaged in the playing of the game. In contrast, using a farm fair is immediately costly to the punisher. Using a farm fair entails remaining on the same spot, which decreases one's chances of reaching the finish first. The punisher also risks an immediate retaliation by the opponent for the punishment given. The penalty is a 'sensible' strategy that one uses while playing the game. The attribution of intent that will be made by the target of a penalty will be an intent to win the game rather than demean or harm the target. In contrast, the attribution from receipt of a punishment is one of a desire to hurt rather than to play the game to win. What are the consequences of these attributes? Regarding the use of penalties, a subject will tend to use the penalty where it is strategically advantageous; i.e., where it enhances her chances of winning or getting ahead of the confederate. Hence, a subject competing to win will use the penalty if she is behind. The further behind in the play of the game plus the more imminent the confederate's victory, the more a subject will use a penalty.

With regard to punishment, use of this should have no relationship to play of the game. It should be *evoked* by confederate's use of punishment. Also, it will be used even if subject is ahead! In fact, the only way to test the difference

between penalties and punishers is to examine these situations where use of the punishment, vis a vis the rules of the game, serves no purposeful, winning strategy.

Rationale for using Functional Aggression

Some evidence from experiments on competition lends support to the hypothesis of using penalties to gain an advantage or reward. A series of experiments conducted by Muzafer Sherif and his colleagues (1966) established an environment for boys at a camp that was rich in competitive opportunities. The rewards to be won were scarce and valued resources (medals, knives). Eleven and twelve year old boys were randomly assigned to one of two groups, located close by, but without contact of each other. Each group established a friendly cooperative spirit and its own identity. Then the investigators set the two groups up against each other to compete for scarce resources. They wanted to see if competition could provoke hostile conflicts.

Fist fights, cabin raids, name calling, garbage wars, flag burning, and aggressive game playing were all evidence of hostile conflict, as a result of the win-lose competitive environment. Sherif noted that the aggressive effects all occurred "without any cultural, physical, or economic differences between the two groups, and with boys who were the 'cream of the crop' of their communities" (Myers, 1990; pp. 490-491). The penalties the boys used against each other served to maintain group loyalty and pride, which contributed to the boys' willingness to work hard against the opponent group to gain the desirable scarce resources.

B. Concluding Remarks on Hypotheses Testing

This present study hypothesizes that a person is likely to match a hostile aggressive act with a counter-aggressive act (due to the norm of retaliation and punishment-induced aggression). A second hypothesis being tested measures the likelihood of using functional aggression (measured with penalties in this study). Here, a person is likely to use penalties when it gives the person a winning advantage, some benefit other than any harm that may result to the 'penalized' person. An experiment is the method selected to study what evokes aggression in a dyad interaction episode. A brief discussion of the benefits of applying an experimental method to test aggression hypothesis will now be presented before examining the actual thesis experiment for its findings and relevance to studying aggression in dyad relationships, be they casual or intimate ones.

The experimental technique, as applied by Patterson (1977) in his work with families of aggressive children, demonstrates its appropriateness for testing what aversive stimuli may largely control aggression in other two-person exchanges, i.e., spousal aggression. By finding out what in a child's family environment had a

'main' or controlling effect on child aggression Patterson was better armed to a) test for other possible controllers, and b) to intervene in the negative family dynamics in order to exchange reinforcers of hostile behavior for reinforcers of constructive social behavior. An experimental design that allows investigators to test for *interaction effects* of several variables in addition to main effects of one variable is particularly useful where certain predictor variables are suspected to 'interact' with one another to produce varying impacts on aggression response. If interaction effects do exist they make explanations for aggressive behavior in social interaction more complex than 'one cause-one effect', i.e., past childhood violence is not the sole cause of aggression response in adulthood. The potential is, therefore, increased for presenting causes of aggression that better reflect the reality of people who actually use aggression in their relations with others. Patterson (1977) conducted an experiment to test the causal status of certain parental stimulus over child aggression rates, and his work is highlighted here as a method that successfully tested what evokes aggression during family interaction. Patterson shows dramatically that consistent parental non response to a child's aversive behaviors and selective parental reinforcement of prosocial child behaviors may convert the negative exchange to a positive one.

In Patterson's study (1977) he wanted to see what effects varying parental stimuli had on a child's aggression rate. His experiment was conducted in part to try to answer what in a child's social environment controlled his or her negative behaviors, including aggression and violence. Earlier family observations that were unobtrusive had been done by Patterson and his colleagues. These findings indicated numerous factors were strongly associated with a child's hostile responses. Some of the parental stimuli were negative in nature, but some of the stimuli that evoked negative child behaviors were not negative reinforcers, and were unintentional in eliciting child aggression. For example, ignoring a child rather than talking to that child increased the probability of that child continuing to be aggressive. Thus, Patterson applied experimental techniques in which he manipulated some parental stimulus in a controlled setting in a laboratory. He observed how child rates of aggression altered in response to the parent presenting or removing certain stimulus thought to elicit aggression.

Patterson's (1977) experiment on child aggression involved 10 mothers and their preschool children. Patterson found that the original baseline rate of child aggression was significantly lower when the parental stimulus was absent from the parent-child interaction period (@ ten minutes), than the aggression rate when the stimulus was presented during a second parent-child interaction period. When the parental stimulus found to evoke aggression in the child was again removed in a third interaction period, the child's aggression response rate dropped to a similar point as the original baseline rate. His experiment demonstrates that some parental stimuli are strong reinforcers of their child's hostility within their social environment, i.e., the child's home environment.

The point of Patterson's study is to show that parents and children *do* interact, but in complicated ways. Furthermore, aspects of the parent's behavior may inadvertently reinforce aversive behaviors by children. An example of this is the parent who gives in to a child's tantrum in a grocery store. This reinforcing consequence will evoke more tantrums from the child. In turn, this will initiate a flood of punishing, aversive parenting behaviors attempting to control the child. This will result in an intense, ongoing negative exchange of aversive behaviors from both parent and child.

Patterson realizes the significance of contingency in interaction in his studies on family conflict. Past consequences or future anticipated ones act to reinforce or diminish a child's aggressive behavior. He notes how the child during parent-child interactions will try to 'catch the parent's attention' using tantrums and other coercive behaviors. The quiet times of disengagement and disregard, i.e., each party trying to stay out of the other's way, is interrupted with hostile matching exchanges between parent-child. Positive influence ways have either not been learned or are not effective in communicating needs to the parent and evoking an appropriate response. The child's use of tantrums, aggression, and coercion forces a 'non-attending' parent to attend *and* respond to the aversive stimuli because of their inherent unpleasantness. Hence, a tit-for-tat pattern of negative exchange emerges that breaks the general pattern of disengagement where conflict behavior is minimal or absent. A consequence of the parent attending to the child's hostility is that the child's negative ways of communicating will be *reinforced* because they are the only behaviors which may have an impact on his or her family environment.

One benefit of applying experimental methodology to studying aggression in parent-child relationships lies in allowing researchers to determine what evokes/controls hostile behaviors in aggressive children. A second and very important benefit is the potential to utilize that information to intervene to help problem families learn new constructive and healthy communication techniques. Both these benefits were important considerations in selecting a methodology to study what evokes aggression response in a two-person interaction episode in this thesis.

The success Patterson enjoyed in his work with families suggests his approach can also be used to test the effects of aversive stimuli on an adult subject's aggression rate in social interaction. This present experiment on aggression causes is regarded as an *initial* step to designing a later investigation that tests what evokes aggression in a marital couple identified as distressed or violent. The experiment on aggressive behavioral responses was done in a university laboratory setting. Hostile and functional aggression were manipulated in a board game played by two people at a time, one confederate and an adult subject. The details of the experiment method are described in the next section, chapter three.

CHAPTER 3

EXPERIMENT METHOD

A. Subjects

Sixty six university students participated in the experiment. The subjects who volunteered were obtained from an undergraduate sociology course at the University of Alberta, in Edmonton, Alberta, Canada. The experiment sessions ran from November to early December, in 1992. The subjects were randomly assigned to one of six conditions. The sessions ended when there were eleven cases in each of the six conditions. Sixty of the cases were deemed suitable for analysis[4].

The mean age of the sixty participants was 22.57 years (s.d.=4.788). The mean year of university attendance was 2.85 (s.d.=.880). The female participants far outnumbered the males, with 83% (n=50) women and 17% (n=10) men.

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[4]Four of the six cases were eliminated due to a confederate effect. One of the two confederates who played the games behaved differently towards the subject from the manipulation measurements. This invalidated the predictor variable measurement. One example of the alteration in the predictor variable occurred when the confederate did not retaliate the subject's farm fair by holding one of his own. In another game session the confederate changed strategy from one condition to another, confounding the results with two manipulations. An ANOVA analysis with the two predictor variables and the confederate as covariate produced a significant confederate effect. When the four incorrectly played sessions by the first confederate were eliminated, along with two randomly selected ones by the second confederate to balance the number of cases in each condition, sixty cases remained; four by the first confederate and fifty-six by the second one. A second ANOVA run with the sixty cases showed the confederate effect had disappeared.

B. Experiment Apparatus

1. Wheat Market Mania Game Parts

1 wheat market mania game-board
1 die
1 plastic small green farm piece
1 set of green farm cards (50 cards numbered f1-f50 with a 1, 2 or 3 on the back)
1 plastic large red farm piece
6 sets of red farm cards (50 cards numbered f1-f50 with a 4, 5 or 6 on the back)
2 identical sets of farm animal hats (9)
2 sets of farm fair instructions for punishment (orange cards with rhyme)
1 set of farm disaster cards for a penalty (26 cards with farm disaster descriptions and numbers from 4-7 on the back)
1 scoring sheet per game to record all moves by both players

2. Experiment Tools

1 set of game rules to be read by the confederate at the beginning of each game
1 experiment condition schedule for eleven games of each of the six conditions
1 questionnaire per game
1 timing device to record game length
coding sheet for data entry of all variables for computer analysis using a Statistical Package for Social Sciences (SPSSx & SPSS-pc)

3. Game Board Details

A game was invented by this author for the sole purpose of testing aggression responses in subjects[5]. Its creation was sparked in part by recent media reports on threats and acts of retaliation by European farmers to perceived unfair restrictions on their agricultural trade. A game with an agriculture theme therefore seemed appropriate for testing effects of punishment and penalties on people. Furthermore, as the experiment was conducted in Alberta, a province with a strong agricultural business, a game called **Wheat Market Mania** was assumed to be familiar enough for subjects to understand quickly how to play it, and to bring some level of commitment to participating in it. The Wheat Market Mania game board was designed by adapting materials from a farm barn and animal kit intended for educational purposes in a classroom setting. It was chosen over a homemade board because of its professional appearance, intended to motivate the participant to become involved in playing the game. Hats were made from cut out animals in the kit by stapling them to an adjustable headband. A headband was chosen over

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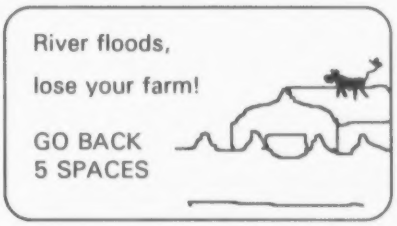
[5]The game is not yet available on the market as a testing tool for aggression. Inquiries about it can be sent to The Sociology Department, University of Alberta, Edmonton, Alberta, Canada.

animal noses or masks because of sanitary reasons. They were also easy to put on and off quickly so that the flow of the game was not disrupted.

There were forty-four spaces on the board from start to finish. The first square was labeled 'start'; the last square was labeled 'finish: grain is sold'; the middle squares were numbered from one to forty-two in the top right corner for recording player positions during a game. Square number eighteen was circled to remind the confederate to start punishing a subject after passing that mark. There was only one route to follow, with the squares being 'hay bales' that wound across the farm barn board. There were fifteen penalty squares marked 'farm disaster'. They were distributed across the board beginning on square nine. Twenty-six different farm disaster cards sat in a pile on the board, to be picked up by a player who landed on one of the farm disaster spots. The penalties ranged from 4-7 on the cards. An example is given of a 'farm disaster' card. A complete list is located in the appendix.

Figure 2 Farm Disaster Card.



4. Farm Size Differences

Both the confederate and subject had a farm piece to move across the board with and fifty farm cards to flip which told them how many spaces to move. All the cards were marked consecutively from F1 to F50 on the top side. Every game a player began by flipping over the card marked F1. The subject always played with a small green farm piece and green cards which ranged from 1-3. The confederate played with a large red farm piece and cards which ranged from 4-6. The confederate's larger card numbers served two purposes. First, the confederate was given the advantage of reaching the farm disaster spots before the subject. A second reason for the confederate getting larger card numbers was to counteract being penalized by the subject. After being put back spaces when penalized, the confederate could move quickly to insure she remained ahead of the subject. If the confederate was backed up behind square nine on the board she would be out of range of the penalty spots and be unable to act out the penalty manipulation.

5. Red Farm Card Codes: Variable Manipulation Reminders

The confederate needed to play every game with the variable manipulations consistent. In order to control the punishment and penalty manipulations, all six sets of the confederate's farm cards were coded as reminders of how she should behave towards the subject. Each set of farm cards, numbered from F1 to F50, had identical numbers on the back for moving across the board. Two card colors indicated whether penalties should be used or passed up; three yellow card sets instructed the confederate to penalize, and three pink card sets told her to not penalize. Three letters indicated how the confederate should punish the subject. The letters I, R, or N were written on each card for punishment initiation, retaliation, or no punishment, respectively.

6. Farm Animal Hats

There were two identical sets of nine farm animal headbands for both players to pick from during a 'foolish farm fair'. They had, however, been ranked prior to the experiment sessions by the experimenter. They ranged by degree of insult, with a hen perceived as the least insulting and a pig as the most. The complete list, starting with the mildest insulting hat, is as follows: hen, sheep, horse, duck, goose, cow, goat, turkey, and pig.

The subjects were not informed of any tentative ranking differences and the hats were placed randomly beside him or her. The confederate held her first farm fair using one of the four most insulting animals. Records were kept in order to see if the confederate's animal choices affected the subjects' choices.

7. Follow-up Questionnaire

A brief two page questionnaire was administered to all subjects immediately following a game. It was given to collect background demographic information such as age and gender, and to act as a manipulation check. A copy of the questionnaire is located in the appendix.

C. Location

The experiment took place in a laboratory setting in the Center for Experimental Sociology, at the University of Alberta during November, 1992. Two essential conditions about the room were that it was isolated from outside interference and that a mirrored wall faced the subject so she could see herself in her animal hat while being punished.

D. Confederate Characteristics

Two people played the role of the confederate in the experiment. The task of the confederate was to behave during each of the games following one of six conditions. Each condition consisted of one punishment manipulation and one penalty manipulation. The recipient of the confederate's controlled actions was a single subject, the 'opponent' in the game. The first confederate, who played 8 games, was a white, male adult; the second who played 58 games was a white, female adult. Both confederates were in university programs; the woman confederate was the experimenter in the project being conducted. The experimenter felt neither confederate had any specific physical characteristics or mannerisms which might have unintentional and unwanted effects on the subjects during the sessions. The male confederate was a member of the course from which the subjects were drawn; the woman was not familiar with any of the subjects, but she had had brief prior contact with the subjects, in the capacity as teaching assistant to their course instructor.

E. Procedure

The experiment was divided into the following sections (see **Table 1**):

Table 1 Division of Experiment Session Tasks by Time.

Time(minutes)	Experiment Session tasks
8	Greetings & game instructions.
15	Maximum game time unless a player wins before then.
5	Questionnaire and debriefing.

Sixty six sessions were run over a three week period during week days to accommodate students' schedules. The six conditions were randomly played until eleven cases were collected for each condition. At the beginning of each session a subject entered a sound proofed room and sat down facing a mirrored wall. The game instructions were read by the experimenter.[6] The subject was told that the

[6]When the first of two confederates played 8 games against subjects, the experimenter introduced the subject to the player (confederate), the scorekeeper, and the rules of the game. When the first

additional person present was the game scorekeeper whose role was to record the player's moves throughout the game. A copy of the actual game instructions given to the subject is provided. The words in quotation marks were read out loud and the words in brackets were acted out by the experimenter.

1. Wheat Market Mania Game Instructions

"You are here to play the Wheat Market Mania game against your rival farmer. I am going to explain the rules and tell you when you can begin. You will probably be here for about 25 minutes. You can quit the experiment anytime you want to, and your name has been recorded for attendance purposes only; it is not recorded on the scoring sheet to maintain anonymity of the game results."

"You are both local wheat farmers in this game. The *goal* of the game is to win by getting your wheat crop to the finish square first." (Points to the board space which says 'FINISH: GRAIN IS SOLD.)

"To *start*, you each place the farm piece you have in front of you on the START square." (Points to the small green farm piece in front of the subject.) "When I tell you to begin, you will both roll a die to see who goes first. The highest number starts. Place your farm pieces on START now."

"You *move* across the board by flipping over one card per turn from the farm card pile directly in front of you. After you move the number of squares written on the underside of that card your turn is over if you land on a square without any message on it. You cannot shuffle your cards, or peek at them beforehand. In addition to moving forward in order to be the first to 'sell your grain' and win, there are two other actions you can do."

"Running a farm can be very difficult. One of the things you can do to your rival farmer is hit her with a 'FARM DISASTER'. A disaster moves your opponent backwards. If you land on a farm disaster square, you have the option of picking up a farm disaster card and using it. Once you pick it up you must use it immediately. Pick up the card, read it out loud, and your opponent must obey it's instructions. Say 'pass' if you choose not to pick up a disaster card, and your turn is over. Remember that all the disaster cards help you if you use them by penalizing your opponent."

"Something else that you can do is hold a FOOLISH FARM FAIR. You can hold a fair anytime during the game when it is your turn. I will tell you how to hold a fair and then demonstrate one for you, with the assistance of the scorekeeper. The farm fair directions are also written out in front of you on the

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confederate withdrew from participating in the experiment after playing 8 sessions, the experimenter assumed the role of confederate. She retained her previous tasks but introduced herself to the subject as the opponent or 'rival wheat farmer'.

long orange cards." (Points to these cards.) "To hold a foolish farm fair, you do not flip over one of your green farm cards to move forward on the board. Instead, you tell your rival farmer you are having a foolish farm fair which she must attend."

"In front of you are nine different farm animal hats. You should pick one and give it to your opponent to wear until her next turn is over. You also tell her to stand up, and sing the silly farm rhyme written on the orange cards, making animal noises that match the hat she is now wearing. Make sure you retrieve your hat later in case you want to use it again." (Demonstrates holding a foolish farm fair. The person being punished behaves in an embarrassed or foolish manner. Some of these actions include hesitating to start, laughing nervously, looking down or away from subject, singing quickly and softly, sloping shoulders or crossing arms, and sitting down immediately following the song, taking off the animal hat and thrusting it back at the subject. The person holding the fair smiles and smirks at the singer.)

"To sum up, the object of the game is to be the first farmer to get your wheat sold. You do this by moving forward across the board the number of spaces indicated on the farm cards you flip over. You can hit your rival farmer with farm disasters when you land on those spots on the board, or say 'pass'. Any time during the game on your turn you can hold a foolish farm fair, and invite your opponent to it. Do you have any questions?"

"Good, you are ready to start the game. Roll this die now to see who gets the highest, and starts." (The scorekeeper begins timing the game and informs the players to stop if fifteen minutes have passed without anyone winning.)

"Stop playing now, the game is done. Thank you for taking the time to participate in this game. I have a brief questionnaire I would like you to fill out now, and then I will tell you about the purpose of this experiment." (The scorekeeper gives the questionnaire to the subject and resets the game for the next session. The scorekeeper checks the questionnaire for completeness after it is filled out while the experimenter debriefs the subject on the experiment.)

"To help you understand what you were doing here I will tell you a bit about the experiment. You played against a confederate who played according to one of six possible conditions. This was done in order to see what effect certain conditions have on your use of penalties and farm fairs."

"I am collecting data to test several hypotheses about the probability of your behaving in ways depending on what the confederate does to you. The scorekeeper recorded all the game turns and actions in order to analyze them later for any behavior patterns that may have developed as the game proceeded over time. I am using the experiment procedure and results in my thesis to demonstrate its potential

for measuring the effects people have on one another during interaction. You will receive a report of the findings after experiment analysis is completed. As I am still running these sessions with other students in your class, it is essential I have your support in not revealing anything about the experiment. I will inform your instructor when all the data is collected. Thanks again for coming in to participate."

2. Recording Data in Game Sessions

A complete scoring sheet (3 pages long) is located in the appendix. A partial section of it is drawn here in **Table 2** to assist the reader in understanding how it was used. It was the only method used to record the experiment data. After all the data was collected for sixty-six games, an additional game was played and videotaped, but only to obtain a record of it, not for scoring.

Table 2 Example of Experiment Game Scores.

WMM GAME RECORDING SHEET

DATE __ __ 92
CASE NO _____
CONDITION _____
START TIME __ : __
END TIME __ : __

FARM ANIMAL TYPES: 1=HEN 2=SHEEP 3=HORSE
4=DUCK 5=GOOSE 6=COW
7=GOAT 8=TURKEY 9=PIG

TURN	PLAYER (C) (S)	MOVE TO SQUARE	USE A DISASTER CARD (C or S) back to	FARM FAIR ANIMAL (1-9)	TURN
1	C	6			1
2	S	3			2
3	C	10			3
4	S	5			4
5	C	16			5
6	S	8			6
7	C	21	S back to 4		7
8	S	11	Pass		8
9	C	21		8	9
10	S	13			10
11	C	21		7	11
12	S	13		3	12
13	C	26	S back to 7		13

The scorekeeper recorded each player's turn by marking an 'S' for subject and a 'C' for confederate. Within the same row, the square they landed on after moving forward on a normal turn was marked. If the confederate penalized the subject, an 'S back to 4' would indicate the subject moved backwards to square 4 (see turn 7 on the sample score sheet). On turn 8, the subject landed on a 'farm disaster' penalty spot (square 11), and chose to say 'pass' or not penalize the confederate. To record foolish farm fairs, the player holding the fair would not move forward. The square number from the previous turn would be repeated on the score sheet. Under the farm fair column, a number from one to nine would be placed to indicate which animal the fair holder selected for his opponent to wear. According to the score sheet presented here, on turn 9 the confederate remained on square 21, making the subject wear a turkey hat (number 8) during that farm fair.

The scorekeeper was trained to keep precise records of the game and instructed to halt the game momentarily if she was uncertain what was happening on any given turn. During the experiment sessions the scoring procedure proved to be simple and effective at keeping accurate measurements.

F. Predictor Variables

1. Punishment

The punishment was measured by a 'foolish farm fair' held by the confederate against a subject. The overall function of the farm fair was to make the subject feel silly, foolish, embarrassed, or emotionally hurt in varying degrees. During a farm fair a subject put on one of nine farm animal hats given to him by the confederate, stood up facing a mirror, and sang a silly children's rhyme, making animal noises that matched his hat. He kept his hat on until his next turn was over. The silly song was sung to the tune of 'The wheels on the bus go up and down'. While the subject was singing, the confederate smirked and smiled and commented on how foolish the subject appeared.

Three variations were created for punishment. The foolish farm fair actions remained the same. Alterations in the timing of the foolish farm fairs held by the confederate measured the three punishment manipulations. For the first punishment manipulation, the confederate would never punish the subject at all. In other words, she would not hold any foolish farm fairs. For the second manipulation, the confederate would initiate punishment by holding farm fairs every time the subject flipped a card and moved forward, beginning the fairs after passing square eighteen. For the third manipulation, the confederate would use the farm fairs in a retaliatory manner against the subject. This meant that the confederate would wait until a subject held a foolish farm fair, retaliating with one of her own immediately afterwards. Under these specific timing rules for the confederate, there existed the potential for her never holding farm fairs under both the no

punishment condition, and the retaliatory punishment condition. The three punishment manipulations were divided into the sixty six games so that each was played eleven times. Codes I, R, or N , for initiate, retaliate, or never punish, were written on the confederate's farm cards to remind her when to punish the subject. The confederate always punished the subject using *only* one punishment variation for that entire game session.

2. Penalty

A second predictor variable used in the experiment was penalty use. A penalty was manipulated in two ways. Giving a penalty consisted of sending a subject back from 4-7 spaces on the wheat game board, depending upon the number on the back of a farm disaster card. Farm disaster cards could be picked up and used by the confederate when she landed on any one of the fifteen 'farm disaster' squares distributed across the board. The confederate penalized the subject for thirty of the sixty games she played, being reminded to do so by the yellow colored farm cards she used.

In order to vary the penalty variable, the confederate did not penalize the subjects when she landed on a 'farm disaster penalty' spot, saying pass which marked the end of her turn. Pink colored sets of farm cards reminded her to refrain from penalizing a subject for thirty game sessions.

3. The Six Experimental Conditions

The two predictor variables, punishment and penalties, were manipulated in the experiment in order to see if there were any main effects on the subject's behavior. A second purpose of the experiment was to see if any interaction effects by the two predictor variables existed. Before the two dependent variables are introduced, a brief comment on the experimental conditions will serve to explain how punishment and penalty use were played together by the confederate during each game.

The distribution of the three values of punishment and two values of penalty use are represented here in a chart. All the possible combinations of punishment and penalty use were played, resulting in a full factorial experimental design. The confederate played each game according to one of the six conditions.

Table 3 Six Experiment Conditions.

PENALTY	PUNISHMENT: no punishment	initiate	retaliate
use penalty	1	2	3
no penalty	4	5	6

Under condition 2, the confederate initiated punishment and penalized the subject. This condition was assumed to be the most 'severe'. In contrast to that, under condition 4, the confederate never punished or penalized the subject. All the farm cards the confederate used for condition 2 were yellow, for penalizing, and coded with an I, for initiating. The farm cards for condition 4 were pink, for no penalties, and coded with an N, for no punishment. This color-coding system for the variable manipulations was devised in order to reduce the risk of mistakes being made by the confederate, which would invalidate the data results.

G. Dependent Variables

1. Subject Farm Fair Frequency

Certain aspects of subjects' behavior was measured in order to see how it was affected by the punishment and penalty manipulations. The subject's foolish farm fair frequency was one of the main dependent variables recorded during the experiment. For each case, the number of farm fairs a subject held were summed. Unlike the confederate, a subject could hold a farm fair anytime during a game, in his turn. A subject did not flip over one of his farm cards and move forward. Instead, he remained on the spot to incur a cost for punishing the confederate. He picked one of nine farm animal hats, giving it to the confederate to wear as she stood singing the silly children's rhyme.

2. Subject Penalty Rate

A second behavior by the subject which was measured as a dependent variable was penalty use. When a subject landed on a 'farm disaster' penalty square, he had two choices. He could pick up a farm disaster card, reading it out loud for the confederate who must obey its instructions to go backwards from 4-7 spaces on the board. The second choice the subject had was to refrain from using a penalty and saying 'pass', which ended his turn. Penalty cards could not be saved for later use. For analysis purposes, a disaster use rate was calculated. A disaster pass rate measured the percentage of times a subject passed on penalizing the confederate out of the total number of times he landed on a disaster spot.

CHAPTER 4

EXPERIMENT RESULTS

A. Descriptive Statistics

Of the sixty subjects participating in the experiment, three quarters were in either their second or third university year ($\bar{x}$=2.85 years of university, s.d.=.880). The mean age was 22.57 years (s.d.=4.788). Eighty three percent of the subjects were female and seventeen percent were male (n=50 F, n=10 M). The average game session was 6.6 minutes (s.d.=4.686). Although the game times ranged from 2 to 15 minutes, each player had an average of 14 turns per game (s.d.=7.979), making the six condition groups similar enough for comparison. The shortest games occurred under the condition of no penalties and no punishment; the longest games occurred under the condition of penalties and frequent punishment initiated by the confederate. Penalties backed the subject up towards the start, and under the initiating manipulation, the confederate held between 3 and 11 farm fairs ($\bar{x}$=5.5 fairs).

B. Main Effects on the Dependent Variables

Two predictor variables, punishment and penalty, were checked using an ANOVA analysis to see what effect they had on the two dependent variables, subject farm fair and penalty use. The ANOVA results are preceded by a brief review of the variables and their measurement. The predictor variable punishment had three values; initiate punishment, retaliate punishment and no punishment. For 20 game sessions the confederate behaved towards a subject with retaliatory punishment only, by holding a farm fair immediately after the subject held one. For 20 sessions the confederate took the initiative to punish a subject every time the subject took a *normal turn* by moving forward. For the final 20 sessions the confederate never punished the subject at all. Penalty had two values; penalize a subject by putting him back spaces, or say pass and not penalize him. In order to penalize a subject the confederate had to first land on one of the 15 'farm disaster' penalty spots. For half of the 60 games the confederate penalized a subject by putting him back 4-7 spaces. The confederate, in each of the sixty Wheat Market Mania game sessions, acted towards the subject according to one of the three

punishment variations and one of the two penalty variations. So each of the six possible combinations were played by eleven people for a total of sixty six cases.

The two dependent variables were subject's use of farm fairs and penalties against the confederate, her rival wheat farmer. A subject could hold a 'foolish farm fair' any time during a game, making the confederate stand up, put on one of nine farm animal hats, and sing a silly rhyme with animal noises. If a subject held a fair on her turn, she remained on that spot to incur a cost for punishing. The total number of farm fairs a subject held in a game measured the dependent variable farm fair. For the dependent variable penalty, the subject, upon landing on a farm disaster spot, had the option of reading a farm disaster card which instructed the confederate to go backwards on the board, or saying pass on the opportunity to use the card. Since penalizing the confederate after landing on a spot was optional, a disaster use rate was calculated to measure how many times out of the total spots landed on the subject actually decided to penalize her opponent. In the ANOVA results, the disaster rate is reported as a 'pass' rate, indicating the percentage of times a subject did not penalize the confederate out of the total number of 'farm disaster' penalty spots she landed on.

C. Questionnaire Responses: Manipulation Checks

1. Smaller Farm Response

All the subjects were given a 'small farm' for play, differing from the confederate's by allowing moves of 1-3 spaces versus 4-6 moves for the confederate. Most of the subjects said having a smaller farm than the confederate was unfair (77%) and impeded their ability to move quickly across the game board (70%). Twenty five percent said they moved at the same speed as the confederate; for these subjects the manipulation failed. Three percent said the smaller numbered cards motivated them to use disaster penalties whenever possible.

2. Farm Fair Motivation

Of the twenty three subjects who held at least one farm fair, fourteen did it to retaliate against the confederate and two said they did it to be mean or humiliate their opponent. Seven said they did it for fun. The majority (n=37, 62%) never held a farm fair.

3. Punishment Reaction.

Twenty five of the sixty subjects were punished at least once in a game, via a foolish farm fair in which they wore an animal hat and sang a farm song while standing. More than fifty percent (n=15) said they felt foolish or humiliated; 8 subjects thought it was funny, and 2 felt inferior. Out of the thirty five subjects who were never punished at all, 3 subjects who did not punish the confederate

indicated relief at not being punished, saying they *would* have felt embarrassed if they had been punished.

4. Punishing Reaction

Twenty three subjects punished the confederate at least once in a game. An equal number of them (n=9) either said they felt good or satisfied about punishing the confederate, or they thought it was funny. Two subjects said they had no reaction (neutral) and two indicated they felt bad or guilty about punishing their opponent.

D. ANOVA Results

1. Subject Farm Fair Frequency

Review of hypothesis One hypothesis being tested was that a subject was more likely to hold a farm fair when he was being punished (initiation condition) than when the confederate did not punish him (no punishment condition) or retaliated a subject's punishment (retaliatory condition). It was anticipated that the subjects would 'match' punishers for punishers.

There was a strong main effect of punishment on the subject's farm fair frequency. **Table 4** shows manipulating the punishment did have a statistically significant effect on a subject's farm fair (F=13.79, df=2/54, p=.001).

Table 4 ANOVA Results: Main Effects of Predictor Variables on Subject Farm Fair.

VARIABLE MANIPULATION	ms	df	F	Sig.
Punishment	10.47	2	13.79	0.00
Penalty	1.67	1	2.20	0.14
Punishment x Penalty	1.87	2	2.46	0.10
Error	0.76			

Twenty-three of the sixty subjects held at least one farm fair (14 held 1, 3 held 2, 4 held 3, and 2 held 4). The rest (n=37) never held a farm fair. In every case except one, the subject was behind the confederate on the game board when he punished the confederate. Unlike punishment, the penalty variable had no significant effect on a subject's farm fair frequency (F=2.1951, df=1/54, p=.144).

In the section which discusses manipulation checks motivation is given by subjects for retaliating against the confederate with a farm fair. The findings, however, are relevant to this section on main effects. Fourteen of twenty-three subjects who reported holding a farm fair as retaliation did not do it to retaliate against being penalized since penalties had no significant effect on subject farm fairs. The significant effect of punishment on subject farm fairs, together with the subjects' reports of holding farm fairs in retaliation against the confederate, suggests that the subjects discriminated between penalty and punishment characteristics and functions in the experiment. This is illustrated by their matching punishment for punishment, rather than punishment for penalty.

Means from a ONEWAY analysis was examined in order to see if the punishment effect was in the expected direction, that is, punishment given out by the confederate was more likely to make a subject hold a farm fair than if no punishment was given out. **Table 5** provides the mean number of farm fairs subjects held when they were being punished under the three conditions, initiating, retaliating, and no punishment.

Table 5 Subject Farm Fair Frequency.

MANIPULATION GROUP	count	mean	s.d.
no punishment	20	0.200	0.696
initiate punishment	20	1.500	1.277
retaliate punishment	20	0.300	0.571

The statistically significant mean differences between the groups gives evidence that supports the first hypothesis proposed. Thus, when being punished by the confederate, a subject will hold more farm fairs on average than when the subject is not punished. A subject holds 1.5 farm fairs when being punished; he holds only .200 on average when not being punished. The number of farm fairs a subject holds when the confederate only retaliates the subject's farm fair is similar to the no punishment group. A Student Newman-Keuls Test confirmed the differences between these two group means, no punishment and retaliatory punishment, are non-significant statistically. The initiating punishment manipulation is statistically different from the other two manipulations.

No interaction effect was found between punishment and penalty on a subject's farm fair frequency ($F=2.459$, $df=2/54$, $p=.095$). Of all six conditions of penalty and punishment variations, a subject held the most farm fairs ($\bar{x}=2.00$) when he was being penalized and punished regularly under the initiation condition. A non-significant interaction term shows that while this finding is in the expected direction an hypothesis of interaction effect must be rejected.

2. Subject Penalty Rate

Review of hypothesis A penalty will be used whenever it will put the subject ahead of the confederate and whenever it keeps the confederate from winning. The penalty is a behavior maintained by reinforcing consequences. As long as the person anticipates *gaining* some advantage, penalty use will continue. The person using the penalty does not hurt another person by accident or out of anger, but only as an intermediate step to gaining some advantage or reward. By focusing on the reinforcing consequence, a penalizing person may act aggressively without emotional hostility. The hypothesis anticipates then that the further behind the subject is, and the more imminent the confederate's victory, the more a subject will rely on penalties to gain a winning advantage.

There was a main effect of penalty use on the subject's penalty pass rate. **Table 6** shows manipulating the penalty did have a statistically significant effect on a subject's penalty rate ($F=5.7289$, $df=1/54$, $p=.020$). Subjects did not penalize the confederate 23% (s.d.=32.8) of the time out of the total number of spots they landed on. The punishment variable was found to have no significant effect on a subject's penalty rate ($F=2.3396$, $df=2/54$, $p=.106$).

Table 6 ANOVA Results: Main Effects of Predictor Variables on Subject Penalty Pass Rate.

VARIABLE MANIPULATION	ms	df	F	Sig.
Punishment	2233.61	2	2.34	0.11
Penalty	5469.42	1	5.73	0.02
Punishment x Penalty	1006.03	2	1.05	0.356
Error	954.70			

Manipulating the penalty use did have a significant effect on the subject's use of penalties against the confederate. A ONEWAY table provides information on the percentage of times a subject did not penalize the confederate out of the total number of times he landed on a farm disaster penalty spot. The results from **Table 7** suggest that a subject tended to 'match' the confederate's competitive strategy, by increasing his pass rate when the confederate passed on every penalty. The validity for the hypothesis of using penalties in order to gain a winning advantage is also weakened by results that show the subjects were usually behind when they chose not to penalize the confederate. The subject's location in relation to the confederate when the subject said 'pass' was measured. In the games where 25 subjects passed at least once and 15 passed a second time during a game, in 37 of those 40 instances subjects were *behind* the confederate by 2-29 spaces. The evidence does not support the penalty hypothesis.

Table 7 Subject Penalty Pass Rate.

MANIPULATION GROUP	count	rate	s.d.
no penalty (pass)	30	32.262	33.755
penalty (use)	30	13.167	29.356

Looking at the means in **Table 7**, the subjects were two and one-half times as likely to say pass and not penalize the confederate when the confederate was not penalizing them than when the confederate was penalizing them (rate jumps from 13% to 32%). The standard deviation is large for both groups. A frequency distribution revealed that four categories of penalty users existed. There were those who never landed on a disaster spot at all (n=8), those who used 100% of penalties landed on (n=26), those who both penalized and passed during a game (n=20), and lastly, those who used 0% of the penalties landed on (n=6). The change in subject pass rate between the penalty and no penalty groups was found to be statistically significant (shown in ANOVA results) and tends to refute the 'penalty for competitive gain' hypothesis. No interaction effect was found between punishment and penalty on a subject's penalty pass rate ($F=1.05376$, $df=2/54$, $p=.356$).

3. Subject Motivation for Punishing Opponent (confederate)

Table 8 ANOVA Results: Main Effects of Predictor Variables on Subjects' Punishing Motivation.

VARIABLE MANIPULATION	ms	df	F	Sig.
Punishment	5.85	2	3.55	0.04
Penalty	0.60	1	0.36	0.55
Punishment x Penalty	2.15	2	1.30	0.28
Error	1.65			

In **Table 8**, the ANOVA results show punishment manipulation has a significant effect on a subject's motivation to punish ($F=3.55$, $df=2/54$, $p<0.05$). Thirty eight percent (n=23) reported the following reasons for punishing the confederate at least once: to retaliate (n=14), to humiliate or be mean (n=2), or for fun (n=7). According to the numbers in the table, the confederate's penalizing or passing on penalizing the subject, did not motivate the subject to punish the confederate ($P>0.05$); only punishment acted as a motivator for the subject. Sixty two percent (n=37) never punished the confederate at all.

4. Emotional Response of Subject as Punisher

A majority of subjects who punished said they acted in retaliation to punishment meted out by the confederate. The subjects also identified their feelings about punishing the confederate.

Table 9 ANOVA Results: Main Effects of Predictor Variables on Subjects' Feelings as Punisher.

VARIABLE MANIPULATION	ms	df	F	Sig.
Punishment	16.22	2	11.54	0.00
Penalty	0.02	1	0.01	0.91
Punishment x Penalty	0.32	2	0.23	0.80
Error	1.41			

Looking at **Table 9**, punishment manipulation by the confederate was the only factor to have an impact on a subject's feelings about punishing the confederate ($F=11.54$, $df=2/54$, $p=0.00$). Eighteen of the twenty three punishers reported happiness or satisfaction from retaliating against or humiliating the confederate. An equal number of them ($n=9$) either said they felt good or satisfied about punishing the confederate, or they thought it was funny. Two subjects said they had no reaction (neutral) and two indicated they felt bad or guilty about punishing their opponent.

5. Emotional Response of Subject When Punished by Opponent

Table 10 ANOVA Results: Main Effects of Predictor Variables on Subjects' Feelings When Punished.

VARIABLE MANIPULATION	ms	df	F	Sig.
Punishment	7.12	2	6.61	0.00
Penalty	0.02	1	0.02	0.90
Punishment x Penalty	0.32	2	0.30	0.75
Error	1.08			

The predictor variable punishment was the only one to affect feelings in the subject about being punished ($F=6.61$, $df=2/54$, $p=0.00$). Twenty five of the sixty subjects were punished at least once in a game. More than fifty percent ($n=15$) said they felt foolish or humiliated; 8 subjects thought it was funny, and 2 felt inferior. Out of the thirty five subjects who were never punished at all, 3 subjects confessed after the game they would have felt embarrassed had they been punished. The penalty manipulation did not affect how a subject responded

emotionally to being punished, and did not act as an interaction term. According to the results, the subjects being penalized felt the same about being punished as those subjects who were punished but not penalized. This result is not surprising considering the results reported earlier, that penalty manipulation had no significant effect on the likelihood of a subject punishing the confederate.

E. Two Additional Questionnaire Responses: Subject Hostility Foolish Farm Fair Animal Choices

1. Hostility Towards Confederate

Almost all of the sixty subjects indicated they felt neutral, pleasant, or happy towards the confederate as the game progressed (n=54, 90%). Four subjects said they felt frustrated with the confederate but no one was angry or mad. Two subjects, however, reported being angry at the game, or the way the confederate was playing the game. The subjects said they were annoyed when the confederate did not send the subject back spaces when she landed on a penalty spot. They said that the confederate was not trying to 'win' the game which was stated as the key objective of the game when the rules were read to them.

2. Farm Animal Selection

The subject and confederate could choose any of nine farm animal hats to give their opponent to wear as part of the punishment during a farm fair. The selection of both players were recorded in order to check for any matching behavior of animals and to see if the subjects picked the ones that had earlier been ranked by the researcher as most insulting. The subjects were unaware of any ranking between the animals. Hen was the least insulting and a pig was deemed the most. The confederate selected one of the four most insulting animals to start her first farm fair with each game. Only twenty three of the sixty subjects held at least one farm fair. Thirty percent of these preferred a horse hat for punishing the confederate. The horse was followed by either a goose or duck (17% for each). Only one subject chose what was assumed to be the most insulting animal, the pig. If a subject held a second farm fair, horse was again the preferred animal (44%) by subjects, followed by either a goose or duck (22% for each). Six subjects held a third farm fair; four of them selected a hen, the least insulting according to previous ranking. The differences between the confederate's animal choices and the subjects' show that the subjects did not match the confederate. The subjects did however tend to match one another in animal selection.

CHAPTER 5

DISCUSSION

A. Interpretation of Aggression Experiment Findings

The present study investigated the impact of penalties and punishment on aggressive response. The general findings are first summarized and several explanations for the aggression results will be offered. The plausible interpretations will be couched in terms of their relevance to aggressive behavior patterns, i.e., use of violence and other aversive conflict techniques during social interaction. Two strengths of this experiment are that an investigator working from an interaction approach can test stimuli that may control a person's aggression in his or her social environment, and draw out rich details about the relationships that exist among the relevant concepts being measured. The experiment results suggest that a subject's aggressive response rate can be controlled by a partner's behavior. In addition, a subject's counter-aggression rate will vary depending upon the intent behind the aggression used by another person, i.e., the punishment and penalty variables carried different intentions from each other, although both hurt the subject as a consequence.

The experiment did not analyze marital couples for their conflict exchange patterns, making generalizations about how these findings contribute directly to the topic of marital aggression inappropriate. Instead, the evidence on retaliating hostile aggression, and the experimental method that applies a social interaction approach and manipulation of aversive stimuli, will be discussed. This discussion section will focus on the efficacy of the experimental method to test aggression theory hypotheses on casual or intimate relationship exchange data. Several advantages the experimental approach may have for testing aggression patterns in *marital couples in conflict* are offered.

The recommendations suggested here for marital violence research draw largely from reflections made of work done within an interaction framework by Patterson with families of aggressive children. Patterson identified how intrafamilial patterns of interaction inadvertently reinforced aggression. Through behavior modification techniques the family members learned to interact more

positively and constructively, thus increasing the level of quality and degree of satisfaction within their family life.

1. Hostile Aggression (Punishment)

The first issue in this experiment was whether subjects would exchange punishers which served no function, other than hurting the opponent. This experiment hypothesized a 'matching' of hostile aggression between exchange partners. Matching was inferred when a subject responded or reciprocated with a punishment in the form of a farm fair.

Results showed subjects did 'match' the confederate's aggression by holding the *most* farm fairs when the confederate presented fairs in the initiation condition as prior aversive stimulus. In this condition the subject was punished with a fair frequently throughout the entire game. In contrast, under the conditions where the subject never received punishment or was punished only as a consequence to her initiating a fair first, the subjects' punishment means for both these conditions were identical and significantly lower than the means for the condition where the confederate initiated fairs frequently. Thus, the subjects again 'matched' the confederate's complete absence or low number of farm fairs. The evidence concerning the subjects' hostile aggressive behavior under all three conditions lends support for the hypothesis of 'matching' punishers with punishers.

Since *penalties* were also manipulated in the game and were a form of aggression, albeit serving a different function than punishment, the combined impact of both of these aversive stimuli on the subject was checked. The expectation that this was the most 'aversive' condition of all for the subject was not confirmed for the number of farm fairs held. The general trend found in subjects to 'match' the hostile aggression, i.e., holding farm fairs, of the confederate was not altered in any way by the additional use of penalties against the subject. There was no significant statistical interaction found between penalty use and punishment condition on punishment response.

Several explanations for the 'matching' effect of punishers can be found that relate to negative interaction in social relations. It was argued in this thesis that while the term 'to reciprocate' was associated with neutral or good exchanges, the term 'to retaliate' was more appropriately connected with negative, aggressive exchanges. The retaliation norm implies hostile aggression would be *drawn out*, or *provoked* by some previous painful or hostile condition. These prior early aversive stimuli in the game are what Patterson would term 'dense' controlling stimuli. The interpretation that the subjects were following the norm of negative reciprocity or *retaliation* seems to be strongly supported by the subjects punishing the most after being punished first and after being punished frequently. Their own report that they acted 'to get back at' or retaliate against the confederate increases the validity of this explanation.

How can 'retaliation' or 'negative reciprocation' of hurtful behavior that was found in the experiment be explained in terms of why two people in a social exchange might act similarly? Many reasons relate to equity restoration. First, lack of reciprocity of exchanges could lead to *exploitation* by one person from inequitable exchanges. That exploited feeling might increase the likelihood of aggressing against the exploiter, retaliating from being 'ripped off' or 'cheated'. Experiments conducted on equity restoration found that the more people valued their input (investment in another person), the more likely they were to feel that a given outcome was insufficient and thus worthy of retaliation. Foa and Donnenwerth (1974) did a series of experiments on equity restoration, and found that when one person in the experiment setting was harmed emotionally by another, the response was to retaliate. When the degree of injury incurred and the appropriate level of retaliation to 'even the score' was unclear, the subjects reported the best response was to 'do unto them exactly what they have done unto you'. In the condition where the subjects were not punished in an unprovoked fashion by the confederate they may have felt the game players were being 'fair', that both were playing using numbered cards to move forward, and penalties to 'get ahead'. When the confederate punished the subjects first it may have been felt by the subjects to be 'unfair' and 'exploitive', since the subjects had not used punishment yet. As farm fairs were also available to the subject and the only form of punishment they were allowed to mete out, their counter-aggression may have been a decision to 'even the score' and retaliate for being crossed by an opponent who took advantage of them.

Another explanation for a person reciprocating negative behavior comes from the game strategy of tit-for-tat. The idea behind tit-for-tat is being nice via cooperation in exchanges, until that person crosses you. This hostile exchange must be retaliated as punishment for lack of cooperation. Stable cooperation in relationships may encourage fewer conflicts and negative exchanges which can contribute to less aversive conditions. A person is motivated then to retaliate to hostility given first to her, but not to use hostile aggression *until provoked*. The subjects may have punished the confederate back in order to return the favor (pain in this case) that reduced the enjoyment level of playing the game. The rules given out at the beginning of the game stated the players were farmers in competition to sell their grain first and win, and the subject may have been angry and/or disappointed in the confederate who chose to punish them instead of competing to reach the last spot on the game board. The subject may have reasoned that if he or she was going to take the time to play this game and the confederate was acting in a manner counter to the objective then the subject would punish the confederate for not cooperating, for not trying to win as well. If the confederate was disappointing the subject and hurting the subject on top of that, punishing the confederate back may 'pay back' the confederate for her behavior as a lousy game opponent. The punishment may also have been given to the confederate as a message to start cooperating again by playing to win, not playing to punish. The subject showed the confederate there were immediate and negative consequences to not

cooperating. Thus, the tit-for-tat game strategy explanation for exchanging punishers includes reasoning that describes some elements of *penalties* as well. The counter-punishment punished the receiver for 'bad' behavior and tried to get them to display 'good' behavior in the future.

Support exists for the explanation that people sometimes match negative behaviors and affect for retaliatory reasons. Another explanation offered in aggression theory literature is that matching of aversiveness may also result because of the harmful nature of the negative act. A punishment-induced aggression argument to explain matching states that the pain or harm aspect about the prior stimulus itself evokes a hurtful reaction. In some cases merely the threat of the pain, i.e., pointing a loaded gun at someone, might cause someone to react with hostility.

The subjects in the experiment responded to punishment with punishment, not penalties. The confederate had succeeded in causing pain in those subjects. They were more willing to 'lash out' at the confederate. It has been argued that animals and humans are biologically disposed to react aggressively to being hurt, to lash out with aversive hostile behavior. The subject may have returned the punishment as a defensive move in an attempt to prevent the confederate from repeating the punishment later on. The confederate would know that the 'cost' of being punished back was very real. At the same time that the subject was taking defensive measures, in demonstrating her ability to punish as well, her hostile aggressive response could also be interpreted as an intentional inclination to 'harm an available target' after being hurt herself.

Punishers were shown in this experiment on aggression to motivate subjects who felt their 'sting' by the confederate to return the pain. Those subjects who received no punishers or punishers that followed their punishing first, held few farm fairs or, more the norm, held none. Therefore, the hypothesis of matching densities, i.e., frequencies, and in part function, was supported by the evidence. The matching results also indicate the subjects were 'attending' the behavior of the confederate as the game progressed and were influenced by interpersonal factors within the episode. Several explanations for matching of punishers was presented, and were centered around two themes, the 'norm of retaliation' and 'punishment-induced aggression'. A second type of aggression that was measured for effect in the experiment is penalty use. The investigation's findings and explanations for people's use of penalties to gain something from relationship interactions will now be discussed.

2. Functional Aggression (Penalty)

The second hypothesis tested in this investigation was that the subject would penalize the confederate whenever it increased her own winning potential. A

penalty was expected to be used the most when it put the subject ahead of the confederate or when it prevented the confederate from winning by reaching the end of the game board. The penalty was viewed as a behavior maintained by reinforcing consequences. As long as the person anticipated gaining some advantage, penalty use would continue. The person using the penalty would not hurt another person by accident or out of anger, but only as an intermediate step to gaining some advantage or reward. By focusing on the reinforcing consequence, a penalizing person could act aggressively without emotional hostility.

Penalties differed from punishment in that their function was not to demean or humiliate and there was no immediate cost. The attribution of intent that would be made by the target of a penalty would be an intent to win the game rather than demean or harm the target. Did the evidence tend to support the hypothesis that the further behind the subject was, and the more imminent the confederate's victory, the more a subject would rely on penalties to gain a winning advantage? Although there was a significant main effect of the penalty use by the confederate on the subject, it is not clear what was really motivating the subject to say 'pass' or to penalize the confederate. The results need to be discussed in terms of the winning advantages they provided the subject.

Manipulating the penalty did have a statistically significant effect on a subject's penalty rate. The punishment variable was found to have no significant effect on a subject's penalty rate. A subject tended to 'match' the confederate's competitive strategy by increasing his pass rate when the confederate passed on every penalty. Even though the differing rates were significant, many subjects did not penalize the confederate when they were far behind the confederate on the board. The validity for the hypothesis of using penalties in order to gain a winning advantage is weakened by results that show the subjects were usually *behind* when they chose not to penalize the confederate. Sometimes subjects were near the 'start' or the confederate was 'very close' to winning -- yet they declined to penalize the confederate. Penalizing the confederate would lessen this gap by putting the confederate back. The evidence shows the subjects did not seem to use the penalties at every opportunity to increase their winning chances.

What did the subjects gain then, or what motivated them to pass more often when the confederate did? Some subjects played very 'competitively' using every penalty they landed on and others never penalized the confederate no matter how badly they were losing. These differing rates may reflect individual competitive levels that were unaffected by the competitive playing strategy of the confederate. However, a significant number of subjects seemed to be influenced by the confederate not using penalties, suggesting interpersonal factors in the game did influence the subjects' penalty use rate over and above how 'competitive' he or she normally is.

Could an explanation for penalty use lie in a cost-benefit reason? When the subjects punished the confederate, they incurred an immediate cost of staying on the same spot, thereby decreasing their speed in reaching the finish and risking retaliation of punishment back. Perhaps the relatively 'cost free' penalties as a winning technique had some hidden cost in them that the subjects perceived. Maybe they thought hurting the confederate by putting her back, even though it was a 'means to another end', was too costly. Several subjects reported frustration at the confederate not penalizing, not hurting them in order to play competitively. But apparently a significantly large enough group of them were affected somehow by the confederate not penalizing them since pass rates jumped from 13 to 33 percent under this condition. Could it be that when the expectation is that it is all right to hurt someone in order to gain something valuable, and a person seems to go out of her way to be extra 'kind' by giving up a right, different values take precedence in the decision to return that 'act of unexpected kindness'? The recipient of that kind act may become more willing to 'give up' some advantages as well in order to maintain a very pleasant and cooperative environment.

Findings on the second type of aggression, that of functional aggression, reveal penalties being used by subjects to gain something in the experiment. One interesting finding that is not easily explained is the diverse trends which emerged of penalty use. The subjects did not all 'maximize' their winning potential by penalizing the confederate whenever they landed on a penalty spot. Possible explanations that were given for the results focused on gaining 'winning' advantages and operating more 'cooperatively' when the confederate gave up chances to penalize the subject. The penalty use behaviors that were directly observed in the data collection phase and the information gathered on motives for penalizing provide great details of what transpired that still can not be readily explained at the present time.

Perhaps the particular behavior itself, aggression, contributes to the difficulty of explaining how and when it is used. It can serve several functions, i.e., to retaliate or to get something from someone, and can mean several things to those giving it and to those receiving the hostile act. The point here is that even in a relatively tightly controlled environment in which a single subject is observed for response variations to only two types of aggression stimuli other factors not measured in the study are influencing aggression response rates in the subject. What complications do researchers face when they attempt to study what evokes/controls aggression in a dyad relationship where the negative interaction patterns are expected to be more complex than the simple tit-for-tat 'matching' examined in this study? Marital couples are one group that share a history of exchange episodes where many non-verbal and verbal messages are sent, received, responded to, and sometimes ignored. The next section of chapter five will present an argument for using an experimental methodology to examine negative exchange patterns of couples in conflict.

Before moving on to a discussion that recommends how research on aggression causality in marital couples might be designed and implemented, research on marital conflict is presented in summary form. These studies illustrate the difficulties arising when studying aggression exchanges in intimate dyad relationships. They also show that some level of 'matching' of negative behaviors exist that *may* be an outcome or product of the social interaction. The research literature on aggression causality from a social interaction perspective is scant at the present time. However, those studies together with marital violence studies conducted using individual level or sociocultural variables as predictors of aggression suggest (without empirical support to back it) that some degree of 'matching' of aggression and other negative acts is occurring. The marital conflict research that uses sociocultural and individual level variables as determinants of aggression will be discussed first.

B. Research Findings on 'Matching' Trends in Marital Aggression

Several examples of studies suggesting exchanges of aggression as retaliation or as penalties to gain something can be provided. The first selection of studies that will now be discussed did not analyze the data from an interaction framework so they failed to test and confirm whether the spouses were involved in an process of 'matching' negative interactions where certain spousal behaviors reinforced aggression, intentionally or unintentionally. They do, however, indicate that couples do use violence and aggression within their communication patterns and are likely to retaliate if the acts are deemed aversive by the receiver.

Self-report studies on marital violence have found that when prior aversive stimulus injures or insults a family member, a retaliatory response is likely to occur. Walker's (1989) interview study on abused wives' coping strategies found defensive and offensive strategies being used by these wives. Termed 'fight and flight' response to hostile aggression by a partner, when coping skills failed to offer adequate protection to the women, they reported they usually would try to escape the situation, sometimes even killing their abuser in the process.

Steinmetz (1977) examined marital violent exchange patterns and found that battered spouses reported they were reluctant to retaliate an attack for fear of escalation. Those who eventually responded to the aversive conditions were sometimes extremely aggressive.

Straus and Gelles (1985) found in their 1985 survey on family violence that while crying was the most frequently reported response by women to violence, retaliation was the second most common immediate response. Many wives reported yelling, cursing, or hitting their spouses back despite the risks they perceived of escalating the violence. The findings in the literature show spouses

often report retaliating to hurt the other spouse, sometimes in hopes of preventing future violence being used against them.

The literature on aggression in the form of penalties is presented more from a theoretical framework than from empirical findings. Still, a logical basis exists that couples do indeed use aggression as a penalty against their spouse. Part of the problem in testing penalty use in marriage relations is that work up to now has been driven primarily from an approach which analyzes relations of 'intrapersonal' or 'sociocultural' variables rather than 'interpersonal' variables which reflect a social interaction approach. These studies tend to leave many questions still unanswered about the real effect that aggression, when used as a penalty, has on a spouse, and how penalties fit into the ongoing daily interaction patterns of these couples. The arguments presented now on penalty use do, however, suggest that it deserves much more intensive examination. An interaction approach may be a suitable alternate view to test relations between concepts connected with penalty use that are *social terms* by definition, such as 'power' and 'dependency'.

Conflict theory offers one explanation for couples using aggression as penalties as a 'power' tactic. In an arena of confrontation and conflicting interests, violence "is a likely outcome and a powerful mode of advancing one's interests when all others fail" (Steinmetz and Sussman, 1988; p. 744). Underneath the evidence of competition to win marital decisions, make lots of money, or be a great parent or lover, may be a need to establish oneself as an equal in the relationship, an equal who deserves certain resources and privileges.

A partner has several strategies she can use to work toward reaching a goal. She may find it easier to justify the aggression if it is couched in terms of a penalty. She may slap her spouse in an attempt to make him do something that increases her chances of getting some need met (i.e., increasing her power in making marital decisions, or receiving goods or services from him). A penalty in the form of a slap could also be used to show him he has broken some marriage norm or expectation she values. The penalty is a sanction for disobeying her rules and a deterrent against future marital norm violations. If she is successful in getting what she wants from using a penalty, the penalty use is likely to be repeated as it is perceived as a reinforcing consequence (Braiker and Kelley, 1979, p.157; Steinmetz and Sussman, 1988, p.743; Straus and Gelles, 1990, p.196).

The power to influence or coerce one's marital partner into giving something or not giving something seems to be a common thread running through much research and theory about using violence as a 'penalty'. Straus and Gelles (1990) investigated the relationship between stressful life events and the level of marital violence, with marital power as a mediating variable. The effects of stress and power on violence use indicated that husbands who felt stressed were more likely to use violence to control family affairs *if* they also felt they should control most family decisions. Those husbands had an assault rate of 16.1 per 100 as

compared to 5.2 for the husbands who were also under stress but shared decisions with their wives.

At the present time the literature that uses intraindividual or sociocultural determinants as explanations for marital aggression suggests that hostilities are 'attended' to if aversive and painful enough and are responded to with more hostility. The research, though, lacks evidence regarding the variables that actually *produce* negative exchanges in distressed couples.

What have theorists working from a social interaction perspective found in studies on marital conflict? Results of three works will be presented. All three share in their procedures attempts to measure the dynamic process of marital conflict in couples. To meet this objective the data is collected while permitting each subject couple to interact in a natural free-form style with no researcher manipulation of subject behaviors during ongoing exchanges. They also attempt to identify differences in the interactive process between violent and non-violent couples. The first to be discussed is work done by Lloyd.

In Lloyd's (1990) investigation, she was searching for details of daily or commonly repeated behaviors found in ongoing marital disputes that would reveal patterns, particularly those measuring anger and hostility, that clearly differentiate non-violent from violent ones. In her study 78 couples participated in a ninety minute face-to-face interview and several telephone interviews over a three week period. The value of her investigation for marital violence researchers lies in her analysis which exposes typologies and strategies one or both members of a couple report using during typical conflict episodes in their ongoing relationship.

She found the conflict patterns the violent couples report using differ *qualitatively* more than *quantitatively* from the non-violent couples' strategies. This means that the violent couples reported having similar numbers of arguments as the non-violent couples during the measurement period. Their behaviors, however, during the arguments contained significantly more hostility, anger, verbal attacks, and inflexibility than the exchanges of their non-violent counterparts did. The results were recorded as 'couple' behavior, so it is not clear from the findings whether one or both spouses in the violent couple group engaged in the negative behaviors. There is an implied assumption in the study that both members in the violent marriages engaged in negative interaction as typical or commonly used conflict negotiations. It is not apparent from the findings whether both partners were *similarly* hostile to each other. In other words, the evidence is vague concerning precise 'matching' of 'niceness' or 'meanness'.

Since Lloyd's focus is on locating differences in strategies and typologies *between* violent and non-violent groups, her data collection techniques did not allow her to analyze the exact behaviors that were exchanged during conflict *within* the couples themselves. The results still leave unanswered what specific negative and

positive behaviors each spouse of violent couples send and receive, ones that may be part of a pattern of conflict negotiations that give rise to violent responses. She does not address the question of whether the patterns the violent couple report using are a result of the very process they are engaged in. For example, the study does not check to see if it is the wife's yelling during the beginning of arguments that causes the husband of violent couples to yell back or walk out. He may respond this way to disagreements in other settings, such as at work. Prior socialization may account for this, i.e., he grew up watching his parents interact similarly during conflict.

Two other theorists, (Gottman et al., 1977; Griffin, 1993), also investigate marital conflict from an interaction perspective. One way their studies differ markedly from Lloyd's is that they *do* apply analytical techniques that test whether it is a person's spouse's behavior that evokes, or draws out, a negative response.

In the presentation of the next two studies, analysis of what appears to be 'matching' negativity by spouses in conflict reveals that some negative responses can be interpreted as a 'product' of a spouse's negative stimuli, and some are better explained by factors other than a partner's aversive stimuli. The study conducted by Gottman (1977) that will now be discussed demonstrates the difficulties of analyzing marital conflict as it occurs. At the same time, his findings on patterns of negative interaction contributes to the study of marital violence determinants.

Gottman et al. (1977) also investigated marital conflict from an interaction perspective. He examined sequences of nonverbal and verbal behaviors of 10 couples classified as either distressed (clinic) or non-distressed (non-clinic). Instead of having the couples recall what a 'typical' argument would consist of or recall over the telephone what happened during a fight within twenty-four hours of the interview, as was done in Lloyd's 1990 study, Gottman and his colleagues videotaped live arguments as they transpired. These were then put through an extensive transcribing process to draw out rich details of the couples' interaction for analysis.

Gottman first analyzed the negative or positive 'trend' a marital discussion follows by plotting both the husband's and wife's behaviors as they each participated from beginning to end of the discussion. Gottman found the discussion of *both* husbands and wives of distressed couples followed a pattern of repeated negative interaction that was absent in non-distressed couples. Even when distressed couples' verbal messages (content) were not negative, they tended to exchange negative nonverbal behaviors, i.e., saying yes while shaking one's head. The non-distressed couples exchanged more positive behaviors than the distressed ones did, and their verbal and non-verbal behaviors were consistent.

Gottman tested for reciprocity by checking whether a spouse's positive behavior, for example, significantly affects the probability of the other spouse

responding positively, over and above a baseline measure of positive behavior. In other words, a spouse's behavior has to be *shown* to be the most probable predictor of his or her spouse's behavior, not just *assumed* to be. Lag sequential analysis was performed on the couples' affect codes (non-verbal behavior) in order to see if couples reciprocated affect. The reciprocal patterns that emerged from the analysis led Gottman to suspect that a simple one-to-one matching theory does not adequately explain the complexity of reciprocity in his results. Sequential analysis, tracking both spouses' behaviors alternately throughout the entire conversation, showed a different likelihood of reciprocating behavior for couples at the beginning of the discussion than at the end. For example, distressed couples were less likely to reciprocate positive behaviors at later parts (lags) than non-distressed couples were. Non-distressed couples, in contrast, were less likely to reciprocate positive affect early on in the discussion than distressed couples were. Both distressed couples and their non-distressed counterparts showed less positive reciprocity than negative reciprocity.

To see if reciprocity actually occurs because of spousal influence, an analysis was conducted for effects husbands and wives have on each other using the data results of the points they accumulated for acting positively (+1) or negatively (-1) throughout the discussion. As a couple conversed, if the husband emitted a behavior coded as positive he received a point. If his next action was positive he received another point. Gottman conducted an analysis of covariance with baseline unconditional probabilities as the covariate for conditional probabilities for both negative and positive points. When probabilities of a husband or wife acting positively or negatively as a response to their spouse's immediately preceding one was estimated, *only* the husband's positive behavior had a significant effect on the wife's likelihood of reciprocating positively for non-distressed couples. For distressed couples, neither of the spouse's positive behaviors had a significant effect on each other's positive or negative behavior. For the distressed couples, then, reciprocity of positive behavior was clearly absent. In summarizing this, it is clear that in an ongoing interaction, couples in conflict do not attend to or respond favorably to positive behavior issued by their partner. Effectively, no 'exchange' *per se* in terms of reinforcers occurs. However, distressed couples are more likely to engage in a tit-for-tat exchange of negativity.

Discussion of Gottman's study demonstrates his methodology succeeded in tapping patterns of conflict negotiations that discriminated distressed couples from their non-distressed counterparts. Gottman was also able to plot any trends of similar or 'matching' behaviors both husbands and wives expressed from the beginning of an argument to the end. Perhaps, of most importance to this present thesis examining negative responses during marital conflict, is his finding that what 'appears' to be a negative reply to a negative stimulus emitted by a spouse is not always a *consequence* of spousal behavior when tested for reciprocal effect. He may respond this way from habit. His negativity is part of a regular response to being placed in a negative situation, one that he has experienced several times

before with his spouse. In these situations of conflict, the memory of past cumulative negative interactions and outcomes acts as negative stimulus on his response. Just being confronted with a negative event evokes an ongoing pattern of negative responses toward a spouse, regardless of the content or affect of that other spouse as the argument proceeds.

A more recent dyad interaction study was done by Griffin (1993) in which he applied event history analysis techniques to marital problem observations in order to measure interaction process effects. Griffin's marital conflict investigation of negative affect states illustrates the value of examining repeated behavior patterns in marriages. The primary objective of the study was to see if and how variables affected the likelihood of a spouse, during interaction, changing from a negative state to a positive or neutral one.

Griffin collected marital interaction data of nineteen couples in 'real time' using videotapes to record two twelve minute conversations between each couple. Both members of couples were taped individually during the positive and negative interaction tasks. The positive one consisted of discussing happy memories and the negative one of a relevant marital problem. The interaction data were coded after using the videotapes. The members themselves watched the tape and coded on a computer continuous measurements of 'how they were feeling at that moment' throughout the entire conversation. This coding technique successfully limited the risk of external coders misinterpreting the person's affect state.

Using event history analysis Griffin regressed the duration of negative affect on predictor variables. Negative state duration refers to how long a person is in that state over the twelve minute conversation. Griffin found both husbands and wives expressed greater negative affect during the negative interaction task than the positive one. Men, on average, reported lower overall negative state durations than women, regardless of the pleasantness or unpleasantness of the task. For example, men were more likely to move out of a state of feeling negative to a neutral or positive one than women, and women who reported marital dissatisfaction were the least likely of all people to stop feeling negative during the conversations. Griffin's method was useful for determining negative state duration differences between couples *and* between husbands and wives within those relationships.

Griffin also checked to see if both spouses' generally positive state during the positive task and negative state during the negative task was influenced by the affect state of their spouse. Griffin measured whether a spouse's positive affect state at any given time during the two conversations significantly influenced the partner's likelihood of becoming more positive; i.e., whether a matching of affect state occurred. He found the affect state of one's spouse **did not** affect whether that person moved out of a negative affect state or not. In other words, if a husband was expressing positive affect at some time during the conversation, that

was not enough to draw the spouse out of a negative affect state. Other variables such as education, or an interactive effect between time and marital dissatisfaction for men, and marital dissatisfaction alone for women, had significantly stronger impact on their affect state transitions.

Griffin was able to determine whether husbands or wives were more likely to express negative affect and within what kind of situation (positive or negative task). His findings also revealed that one spouse's affect state did not influence the other's. Instead, level of marital dissatisfaction, education level, time spent feeling negative during the discussion, and type of task were more powerful determinants of moving out of a negative state. Gender also affected how much influence these factors had on negative state duration.

In summary, this study shows that extraneous factors, residing outside the current interaction, may determine affective state. This study also shows the difficulty of either member of a couple moving an interaction out of a steady state negative exchange. That is, once an exchange of punishers occurs, there is little that can be done to shift to a positive exchange simply by one party offering reinforcers.

Event history analysis and lag sequential analysis are suitable techniques for measuring negative behaviors that are a product of the marital interaction process. Of the three theorists just examined, Lloyd's study (1990) was the least successful in plotting 'matching' negativity during arguments, patterns which may give rise to violence. The other two theorists were able to test for reciprocity effects as part of their analyses of data that showed 'trends' of matching messages and affect states. Reciprocity seems to be one principle of social interaction that these theorists found deserved attention as a potential explanation for negative behavior patterns that reinforce more negative behaviors. Griffin (1993) and Gottman (1977) both tested for reciprocity of affect in their social interaction studies. They did not find this reciprocity. The opposite seems to be the case, particularly concerning distressed couples. They really are not interacting in the sense of attending to each other and changing their behavior in response to the other! Whatever exchanges were taking place, especially of negative acts, such as hostility or verbal attacks, were influenced at least in part by stimuli other than those offered by the other person. When the couples did respond to one another, they were slightly more likely to respond to negative actions by a partner than positive overtures, but even negative behaviors elicited by one spouse did not evoke a consistent 'matching' negative response in the other. The couple's ongoing responses showed a lack of 'retaliation' to aversive stimulus. The distressed couples were clearly acting in a manner of disengagement and non-attending.

What is apparent is that in spite of the weak findings of reciprocal impact some interpersonal factors had on negative or positive matching behavior, some kind of minimal 'matching' was still recorded. For those theorists who suspect

aggression and violence have certain 'exchange' properties, the work presented by these three theorists on marital conflict contain findings that raise issues about what might make a person respond aggressively during a dyad exchange episode. One issue is how 'matching' aversive acts can happen if non-attending is prevalent between partners.

One consequence of non-attending behavior of distressed couples in conflict is that both members tend to 'tune each other out' with a pattern of disengagement emerging in their relationship dynamics. They are not therefore in a position during interaction to perceive or respond to positive overtures from the other member. One member of a couple who does try to be positive, i.e., move from complaining to agreeing with a partner, will be ignored or rebuffed. Seeing they have no influence over the other person they will consider further conciliatory actions as hopeless. If they continue to exchange at all, it will be an angry, hostile exchange.

The steady state solution for a distressed couple which stays together is plainly one of non-interaction, non-response. That is, for the couple who remain together, but are in conflict, the 'best' way to avoid future misery is to not respond to the other. In doing so, a member will miss out on positive overtures from the other; the couple is caught in their ongoing daily relations in a negative steady state.

How might a distressed couple who are in conflict and do not attend to each other move out of that state to one where one member can get the other to pay attention? One way to catch the other party's attention is to get very aversive, i.e., become very aggressive, deeply depressed, or ill or injured in some way. Under such circumstances it is difficult for the other member not to be affected, which increases the probability of that person responding directly to his or her partner's 'attention-getting' behavior. To deter the aversive, 'attention-getter', the natural response would be to return the aversive favor, i.e., to reciprocate with something equally unpleasant. This is done in order to make him or her go away and return to the normal, steady-state of disengagement. Reports by distressed couples in Lloyd's work (1990) on the conflict strategies and techniques they use, provide weak but suggestive evidence for existence of non-attending being mixed with occasional hostile exchanges. The distressed couples report avoiding initiating conflict, not negotiating, and being very inflexible much more than their non-distressed counterparts do. They also report using many more verbal attacks, hostility, and anger than non-distressed couples during conflict episodes. While Lloyd was able to determine some important differences in conflict strategies between distressed and non-distressed couples, her findings fail to provide strong evidence of how and when distressed couples use aversive behaviors on each other. For example, when one partner breaks the avoidance pattern by suddenly yelling at the other partner, does it evoke a tit-for-tat verbal attack right back?

The theorists Lloyd, Griffin, and Gottman, in their efforts to examine conflict as a dynamic process between two people across time and settings, attempted to measure what couples do that reflects their typical conflict negotiation patterns. Two of the three theorists used techniques that monitored couples interacting on a negative task, and the third, Lloyd (1990), drew out strategies both spouses used, as a couple, through intensive interview sessions. Could it be that their design methods and data collection techniques aided the goal of tapping into complex dispute patterns, but hindered their goal of finding significant interpersonal factors that reinforced aggressive response in spouses? Indeed, studying free interaction may hinder theorists' ability to determine what matching principles occur if the negative exchanges do not reflect 'a simple tit-for-tat' exchange pattern.

C. Research Recommendations

Can this present thesis' particular design be useful to test causes of aggression and violence in a more intimate dyad relationship, i.e., a marriage? The experimental design is applicable for determining behaviors suspected to evoke and increase aggressive exchanges in couples identified as violent/distressed. Such findings would help theorists understand better those 'qualitative' differences between violent and non-violent couple's daily interaction patterns, ones that place some couples in a higher risk category of using very aversive conflict tactics.

Numerous marital violence studies in the literature already suggest a spouse will respond to aggression being used against them with counter-aggression. The lack of research done on marital aggression being used to penalize another gives merit to applying the type of aggression study conducted in this project to studying what purpose certain types of aggression serve in a relationship. How do the consequences of using aggression as a punishment or penalty differ, if they do, and how does their actual use, or threat of use, act as a reinforcer for more aggression by one or both partners?

The reasons for these occasional but harmful exchanges merit more investigation in order to find what evokes and reinforces aggression. As part of an investigation into what controls the onset of aggression and retaliatory behaviors, past marital interaction studies and this present study on aggression responses indicate the 'meanings', including **intent** of the aversive stimuli, can be manipulated and tested for varying counter-aggression responses. Including this level of specificity in a test for aggression causes in marital relationships means the relevant concepts need to be operationalized under relatively carefully controlled settings for any positive results to be interpreted with a degree of confidence.

Here the experimental method is useful for testing hypothesis about interpersonal factors controlling aggression in a dyad. Such a design may serve to produce results about relationship dynamics and significant effects that the more loosely structured designs of free interaction applied by past marital interaction investigations could not. If distressed couples are involved in conflict patterns that include general times of 'disengagement' and infrequent sessions of hostile exchanges, uncontrolled observations of these couples may hinder efforts to observe those infrequent exchanges of non-constructive and potentially harmful communication episodes. Work done by Patterson with families of aggressive children found through intensive observations that these complex rituals exist between family members that are hard to collect and make sense of, but that do seem to reflect some behavior patterns across time that distressed couples may be experiencing as well. That is, from the ongoing interaction process a history is being developed within those problematic distressed families of steady states of negative interaction and non-attending punctuated with outbursts of aversiveness.

Patterson et al. (1982) studied families with aggressive children and found controlling stimuli of aggression in the family interactions. Those behaviors exhibited by parents which reinforced negative and aggressive exchanges, sometimes inadvertently, were then altered to reinforce positive communication messages. Patterson (1982) examined family interactions of aggressive boys. The problematic family exchanges included long sequences of coercion and retaliation. Punishment by parents was often ineffective and actually led to more, rather than less, subsequent antisocial behavior. Arguing, threatening, or teasing by one individual elicited retaliation from another family member, which would exacerbate the behavior of the first member. All these examples of matching pain-for-pain demonstrate how situations of recurring pain or hurt can evolve into 'normalized' unhealthy patterns of interaction in families. The 'powerful' response that punishment evokes in family members may partially explain how families get caught in a 'cycle of violence'.

An important aspect of Patterson's work with aggressive families, which is being advocated as a useful step to helping violent couples change their unhealthy manners of communicating with each other, is to take an active interventionist role. This is a necessary step if the objective is to go beyond identifying what stimuli evokes aggression and violence in a spouse, to what the immediate and longer term consequences are from the counter-response by the other spouse.

Patterson and his colleagues approached problematic families with aggressive children with the objective of helping them to learn new communication skills that allow the members to attend to one another more constructively and positively. Part of Patterson's success in discovering causes of violence in violent families is due to the series of steps he and his colleagues took in order to test the causal status of certain interpersonal factors within problematic families that seemed to be highly correlated with the presence of coercive and aggressive behavior in

children. Gottman and Griffin collected data of an actual argument between spouses as it transpired and did not manipulate stimuli thought to be controlling aggressive responses in another family member. Patterson took a more 'active' investigative position by intervening in their exchanges. He was armed with the knowledge from extensive family observations that the families of aggressive children he worked with tended to avoid confrontations that were painful and unpleasant, which resulted in a general state of quiet 'disengagement'. This pattern of avoidance of hostility was broken infrequently by hostile exchanges where parent-child were 'paying attention' to each other, and were responding to aversive stimulus with matching negativity. Patterson wanted to investigate further the complex patterns of avoidance and confrontation his observation results provided. These were patterns of interaction that suggested a simple tit-for-tat exchange of positive and negative reciprocity was not a satisfactory explanation for how violent family members seemed to be operating with one another.

This present study on aggression analyzed responses by a subject to a consistently repeated single value of the punishment and penalty variables. Unlike Patterson's experiment (1977) where some aversive behavior by a parent was presented and removed to the same child subject during three experimental phases, the punishment level in this experiment varied **between** subject treatment groups, not within the same subject test. A more robust test of what produced and controlled an aggressive response in the subject during the board game would have been to vary the punishment given out by the confederate during the same game. The purpose behind such an alteration in conducting the experiment would be to compare a base rate of subject punishing behavior when no aversive stimulus is presented to him or her, with a rate when it is presented. Thus, probability estimates could be calculated that strengthen or weaken the confederate's hostile behavior as the primary controlling agent of the subject's counter-aggression. The subject's response would not just 'appear' to be matching of aggression but would be the most likely result because of the confederate's behavior toward the subject. This would address the problem other marital violence investigators saw of satisfied non-distressed couples exchanging positive behaviors as a result of their normal way of acting because they were happy, not as a result of the immediate effect their spouse was having on their responses. It would also help identify what is producing what appears to be a matching of negative behaviors in distressed couples that **failed** to be significant impacts when spousal behaviors were tested for reciprocal effect.

This present investigation used an interaction approach as its primary theme of reference to illustrate the power such a perspective has for testing causes of aggression in a two-person relationship across time. The importance was stressed on testing *interpersonal* factors as potential causes of aggressive behavior across exchanges. Theory and research evidence on aggression causality, however, suggest aggression is probably a product of a complex mix of *intraindividual* factors, and *sociocultural* factors in addition to interpersonal ones. For example,

an adult's poor communication skills together with a background of violence in childhood may dramatically alter his or her likelihood of reacting aggressively towards a hostile partner. The important point here is that investigations of aggression in dyad relations using a social interaction approach can contribute to a better understanding of what controls aggression only if those investigations incorporate, at some phase of testing, many variables found to be strongly associated with the presence of aggression or violence in relationships. To ignore key variables that preside in approaches other than an interpersonal one puts investigators, searching for causes of aggression, at risk of producing theoretical models that are too simplistic, and non-representative of groups who engage in aggression to be useful.

Marital couples are one group who are expected to express negative interaction patterns that are a result of varying effects of numerous interpersonal, intrapersonal and sociocultural variables. Marital aggression and violence studies would probably benefit from a 'marrying' of several approaches that test for effects on aggression from **both** the dynamic process the two people are involved in and descriptive characteristics of the couple. Numerous marital violence studies have found that positive and negative 'matching' exchanges by couples are not necessarily occurring due to each other's actions. There is some evidence now from the sparse work done on violent couples using an interaction approach that couple's interaction patterns do not reflect a simple tit-for-tat one of reciprocity of exchanges across time. There seems to be some merit therefore to designing an experiment on marital aggression causes that presents and removes only a few relevant stimuli of any hypotheses being explored that test theories of aggression having exchange properties. Perhaps investigations on couple exchanges need to be broken apart more so that small pieces of it can be examined to really understand what acts as reinforcers or extinguishers of aggression. The investigations would test only a few variables at a time of interpersonal factors suspected to control aggression *and* also analyze other factors in a person's demographic makeup that may significantly increase or decrease the risk of that person acting aggressively/ violently towards others he or she interacts with. This approach would be in contrast to the general trend occurring today with marital violence studies. That trend consists of designing and administering extensive family violence surveys as the solitary investigative approach. These surveys ask couples to report on an ever increasing list of concepts available that have been connected somehow to some theory of family violence, i.e., collecting data on past violent childhood experiences, or statistics on employment levels, dependency levels, and family decision power levels.

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APPENDIX A

Experiment: Follow-up Questionnaire

WHEAT MARKET MANIA QUESTIONNAIRE

Please circle one letter only for each question.
There are no right or wrong answers.

1. **How did having a smaller farm than your opponent (movement range 1-3 per turn) affect your playing the game?**

   a) moved across board too slowly
   b) did not notice any difference in ability to move
   c) other _____

2. **Do you think it is fair that you got a smaller farm than your opponent (large red farm movement range 4-6 per turn)?**

   a) no b) yes

3. **Did your opponent use disasters against you?**

   a) no b) yes

4. **Generally, would you say you used disasters against your opponent:**

   a) whenever you landed on a disaster
   b) only if your opponent used them too
   c) occasionally if opponent got too far ahead
   d) other _____

5. **Generally, when did your opponent hold FOOLISH FARM FAIRS?**

   a) never
   b) randomly (no discernible pattern)
   c) right after I moved forward
   d) right after I held a fair

6. What was your reason for holding FOOLISH FARM FAIRS?

a) did not hold any fairs
b) to get back at opponent (retaliate)
c) to win the game
d) to be mean (embarrass, humiliate, hurt) to opponent
e) other _____

7. How did you feel when you had to be an animal at a FOOLISH FARM FAIR?

_____

8. How did you feel when your opponent had to be an animal at a FOOLISH FARM FAIR you held?

_____

9. As the game progressed how did you feel towards your opponent?

a) neutral
b) frustrated with him/her
c) angry or mad
d) pleasant or happy

10. Year of program 1 2 3 4 5

11. Age _____

12. Gender a) F b) M

THANK YOU FOR YOUR PARTICIPATION

It is essential that you do not talk about this experiment until testing is complete; your cooperation is vital to its success!

APPENDIX B

Experiment game: Score sheet

WMM GAME RECORDING SHEET

DATE __ __ 92
CASE NO _____
CONDITION _____
START TIME __ : __
END TIME __ : __

FARM ANIMAL TYPES: 1=HEN 2=SHEEP 3=HORSE
4=DUCK 5=GOOSE 6=COW
7=GOAT 8=TURKEY 9=PIG

TURN	PLAYER (C) (S)	MOVE TO SQUARE	USE A DISASTER CARD (C or S) back to	FARM FAIR ANIMAL (1-9)	TURN
1					1
2					2
3					3
4					4
5					5
6					6
7					7
8					8
9					9
10					10
11					11
12					12
13					13
14					14
15					15
16					16
17					17
18					18
19					19
20					20
21					21

CASE NO _____
END TIME __ : __

FARM ANIMAL TYPES:

1=HEN	2=SHEEP	3=HORSE
4=DUCK	5=GOOSE	6=COW
7=GOAT	8=TURKEY	9=PIG

TURN	PLAYER (C) (S)	MOVE TO SQUARE	USE A DISASTER CARD (C or S) back to	FARM FAIR ANIMAL (1-9)	TURN
22					22
23					23
24					24
25					25
26					26
27					27
28					28
29					29
30					30
31					31
32					32
33					33
34					34
35					35
36					36
37					37
38					38
39					39
40					40
41					41
42					42
43					43
44					44
45					45
46					46
47					47
48					48
49					49
50					50
51					51
52					52
53					53
54					54
55					55
56					56

CASE NO _____
END TIME __ : __

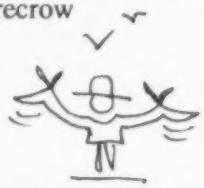
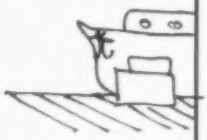
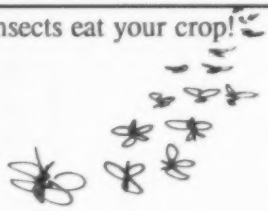
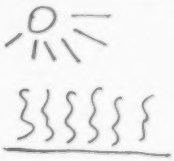
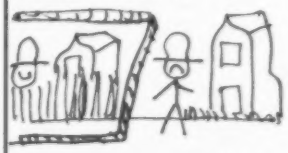
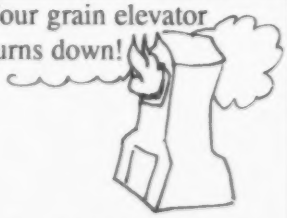
FARM ANIMAL TYPES:

1=HEN	2=SHEEP	3=HORSE
4=DUCK	5=GOOSE	6=COW
7=GOAT	8=TURKEY	9=PIG

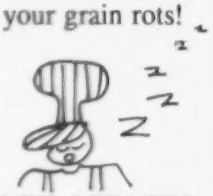
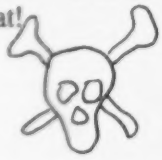
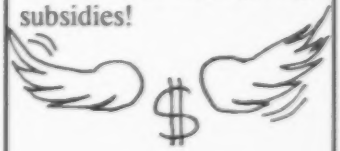
TURN	PLAYER (C) (S)	MOVE TO SQUARE	USE A DISASTER CARD (C or S) back to	FARM FAIR ANIMAL (1-9)	TURN
57					57
58					58
59					59
60					60
61					61
62					62
63					63
64					64
65					65
66					66
67					67
68					68
69					69
70					70
71					71
72					72
73					73
74					74
75					75
76					76
77					77
78					78
79					79
80					80

APPENDIX C

Experiment game: List of 26 DISASTER SPOT (penalty) CARDS

Crows carry off your scarecrow  **GO BACK 4 SPACES**	Ship dock workers go on strike; your grain rots!  **GO BACK 6 SPACES**	Insects eat your crop!  **GO BACK 5 SPACES**
Drought, no crop grows!  **GO BACK 6 SPACES**	New wheat tax! **GO BACK 4 SPACES**	Get a loan to replace farm equipment! **GO BACK 5 SPACES**
Farm help quits! **GO BACK 4 SPACES**	Your farm animals get sick! **GO BACK 6 SPACES**	Oops! Planted your wheat too late!  **GO BACK 5 SPACES**
You (or your spouse) has twins this summer! **GO BACK 6 SPACES**	Your grain elevator burns down!  **GO BACK 4 SPACES**	World wheat prices tumble! **GO BACK 7 SPACES**

Experiment game: List of 26 DISASTER SPOT (penalty) CARDS, continued

You get sick and cannot work! **GO BACK 7 SPACES**	Train workers go on strike; your grain rots!  **GO BACK 6 SPACES**	Cannot get a loan to buy new equipment! **GO BACK 4 SPACES**
Fire ruins your crop! **GO BACK 4 SPACES**	Pesticides contaminate your wheat!  **GO BACK 6 SPACES**	Boat carrying your wheat overseas sinks! **GO BACK 7 SPACES**
Early snow before harvest kills crop! **GO BACK 6 SPACES**	River floods; lose your farm! **GO BACK 5 SPACES**	Your crop gets diseased! **GO BACK 4 SPACES**
Farmers go on strike! **GO BACK 6 SPACES**	Train carrying your wheat crashes! **GO BACK 4 SPACES**	Gas plant contaminates your ground water! **GO BACK 4 SPACES**
Government stops giving subsidies!  **GO BACK 7 SPACES**	Hail ruins your crop! **GO BACK 5 SPACES**	

APPENDIX D

Experiment game: FARM FAIR ANIMAL SONG (punishment)

Silly Farm Animal Rhyme

(sung during a FOOLISH FARM FAIR to the tune of
"The wheels on the bus go round and round")

The ___ in the ___
goes ___ ___ ___ ,
___ ___ ___ ,
___ ___ ___ ,

the ___ in the ___
goes ___ ___ ___ ,
all around the farm!

ANIMAL CHOICES
DUCK in the POND
GOAT in the YARD
TURKEY in the PEN
GOOSE in the YARD
SHEEP in the FIELD
COW in the BARN
PIG in the PEN
HORSE in the FIELD
HEN in the coop

Farm Fair Song Example (words match farm fair animal hat):

The duck in the pond goes quack, quack, quack,
quack, quack, quack, quack, quack, quack,
the duck in the pond goes quack, quack, quack,
all around the farm!